STATEMENT OF WORK

FOR

MAINTAIN/REPAIR/CONSTRUCT BASE PAVEMENTS, INDEFINITE DELIVERY, INDEFINITE QUANTITY

PROJECT VNVP 971061

June 1997

PREPARED BY

ENGINEER FLIGHT

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SHEPPARD AFB TX 76311-3333

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REVISED PER MODIFICATION P00002
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SECTION 1A

STATEMENT OF WORK

1. DESCRIPTION OF WORK:

1.1 "Airfield Pavements," when used in this specification, refers to runways, taxiways, aprons, ramps, overruns, their appurtenances and other pavements, located within the airdrome, used in direct support of or for the sole purpose of operating aircraft.

1.2 "Roadway Pavements," when used in this specification, refers to roads, streets, parking lots, driveways, alleyways, service drives, their appurtenances, and all other pavements not considered "Airfield Pavements."

1.3 Work to be done: The work to be performed under this contract and in accordance with these contract documents shall consist of furnishing all necessary plant, labor, materials, and constructing, installing and performing all work shown and described in the contract documents, all of which are made a part thereof.

1.4 Character of Work and Mechanics: The work shall be executed in the best and most professional manner, with the least inconvenience to the Government, by qualified, careful, and efficient mechanics skilled in the trade, and in strict accordance with the contract documents and standards of the industry. Only certified journeymen in respective trades, or apprentices under the direct supervision of certified journeymen, will be permitted to install, supervise installation of, or alter or repair electrical and mechanical systems. Electrical and mechanical systems include but are not limited to: pipe, plumbing, electrical wiring, fire protection systems, welding, equipment and devices. A current state or municipal, tested and issued plumbing/gas and electrical license, will be recognized as certification upon approval by the Contracting Officer. License shall be available for Government inspection at the pre-work conference and from mechanics and electricians at the job site throughout contract operations.

1.5 Location: Sheppard Air Force Base is located in Wichita County, approximately five miles north of Wichita Falls, Texas. The project is VNVP 971061, Maintain/Repair/Construct Base Pavements Indefinite Delivery/Indefinite Quantity.

2. PRINCIPAL FEATURES:

2.1 All work shall be done with the work area occupied. All work shall be coordinated with Civil Engineering Contracts Section, and Base Contracting through the Contracting Officer.

2.2 The work consists of site work and/or electrical/mechanical work required to maintain, repair, and construct pavement, pavement related items, ancillary items, sidewalks, drainage structures, ductbanks, site grading, excavation and other miscellaneous maintenance, repair, and/or construction work comprised of any combination of the Unit Priced Bid Items contained herein on Sheppard AFB.

2.3 The contractor has the responsibility to construct all new curbs and gutters, valley gutters and pavements such that none stand water and each has positive drainage. Absolute minimum acceptable grade for curbs and valley gutters is 0.25% and recommended minimum is 0.40%. Minimum and maximum Airfield pavement grades will be as established in AFMAN 32-8008V1, General Provisions for Airfield/Heliport Pavement Design, March 1994. Prior to construction of any pavements, curbs and gutters, or valley gutters, the contractor has the responsibility and shall notify the Government if there is any indication that the specified grades cannot be met or if the contractor suspects there is an error(s) in the plans or the Government or contractor provided survey data that will result in drainage problems if constructed. The contractor shall allow the Government reasonable time to determine what corrective action, if any, is necessary, to include correction of any errors discovered in either the plans or the survey data. Grade deviations from those shown on the plans required to provide adequate drainage and meet the minimum grade requirements specified above do not constitute grounds for a claim against the Government. However, adjustments in the quantities of unit priced bid items, either up or down, will be made as required to reflect the actual quantities accomplished in the work. Should the contractor fail to notify the Government of errors which will or do result in drainage problems and proceeds with curb and gutter, valley gutter or pavement construction that will not positively drain water, these curbs and gutters, valley gutters, and pavements will be judged defective and shall be removed and replaced at the proper grades, as directed by the Contracting Officer, at no additional cost to the Government.

3. WORK HOURS, UTILITY OUTAGE, AND SPECIAL INSTRUCTIONS:

3.1 Work hours for Roadway pavement locations shall be from 0730 Hours (7:30 A.M.) to 1630 Hours (4:30 P.M.) Monday through Friday exclusive of Federal holidays. Work on Roadway pavement locations may be permitted on Federal holidays and weekends at the option of the Government at no additional cost to the Government, with written notice to the Contracting Officer at least 48 hours before the start of the scheduled work and with permission from the Contracting Officer. Unless otherwise specified or permitted, work hours for Airfield pavement locations shall be on weekends or Federal holidays in accordance with the PHASING REQUIREMENTS specified herein.

3.2 UTILITY OUTAGE: When an extended utility outage is necessary to perform the contract work that will affect an occupied facility, regardless of whether the work area is occupied, the outage shall be performed by the contractor during non-duty hours at no additional cost to the Government. The contractor shall give written notice two weeks in advance of scheduled outage.

3.3 SPECIAL INSTRUCTIONS:

3.3.1 Separate Contracts: The Government reserves the right to award separate contracts for work identical to work covered by this contract, or to perform

such work using in-house forces. Such work will proceed in such a manner and sequence that work under this contract can proceed with a minimum of interference and inconvenience to the Government and the contractor. However, the contractor will be required to provide the maximum degree of cooperation with other contractors engaged in other Government contracts, or in-house forces at no additional cost to the Government.

3.3.2 Task Orders: Performance of services shall be accomplished by the contractor by Task Orders issued, by the Contracting Officer, against the indefinite delivery/indefinite quantity contract, prior to the beginning of specified performance periods during the performance of this contract. The contractor shall be required to perform the services as specified herein. Invoices in four copies shall be submitted when a Task Order is completed or monthly whichever comes first. Invoices shall contain the following:

a. Name of contractor

b. Contract Number

c. Date of Order

d. Itemized List of Services Performed

e. Quantity, Unit Price, and Extension for each unit

f. Date of Performance

g. Task Order Number

3.3.3 Authorized Government Representatives: Personnel authorized to place Task Orders for the Government against this indefinite delivery/indefinite quantity contract will be identified to the contractor by the Contracting Officer.

3.3.4 Allotted Performance Time: When a Task Order is issued, it will specify a required start date and a required completion date computed in accordance with paragraphs and tables below. These performance times represent the **minimum*** performance time the contractor will be allowed. The Contracting Officer may, at his discretion, permit additional performance time for circumstances beyond the control of the contractor or for delays caused by Government scheduling of the work. The paragraphs and tables below from which performance time is derived **do not** include days lost to the effects of weather. Bona fide weather days will be added to the contractor's performance period upon request and verification. Performance times on Task Orders are independent of each other and may run concurrently.

*If, as determined by the Government, it is in the best interest of the Government to negotiate shorter performance time(s) than that allowed for any Task Order(s), as established in accordance with the provisions contained herein, the Government reserves the right to enter into negotiations with the contractor for that purpose.

a. Airfield Pavement Work (Restricted to Weekends or Holidays): 60 consecutive calendar days will be allowed the first $5,000 of each Task Order; One additional calendar day will be allowed for each additional $1,000 up to $55,000; one additional calendar day will be allowed for each $5,000 (or any part thereof) thereafter. Performance time for Task Orders in excess of $195,000 will be extrapolated by adding one calendar day for each $5,000, (or any part thereof). Refer to TABLE 1a. When Airfield pavement work such as repairs to taxiways and/or aprons is permitted during normal duty hours, the provisions of Table 1b, not Table 1a, shall apply. Liquidated damages, at the specified rate, may be applied, at the discretion of the Contracting Officer, to individual Task Orders with no adjustment in the contract unit prices paid the contractor for services rendered.

Minimum Order: $1,000 Combination of Items	*Maximum Order: $1,500,000 Combination of Items*

TABLE 1a: PERFORMANCE TIME AIRFIELD PAVEMENT WORK

DOLLAR AMOUNT	CALENDAR DAYS	DOLLAR AMOUNT	CALENDAR DAYS	DOLLAR AMOUNT	WORK DAYS
1st 5,000	60	33,000	88	85,000	116
6,000	61	34,000	89	90,000	117
7,000	62	35,000	90	95,000	118
8,000	63	36,000	91	100,000	119
9,000	64	37,000	92	105,000	120
10,000	65	38,000	93	110,000	121
11,000	66	39,000	94	115,000	122
12,000	67	40,000	95	120,000	123
13,000	68	41,000	96	125,000	124
14,000	69	42,000	97	130,000	125
15,000	70	43,000	98	135,000	126
16,000	71	44,000	99	140,000	127
17,000	72	45,000	100	145,000	128
18,000	73	46,000	101	150,000	129
19,000	74	47,000	102	155,000	130
20,000	75	48,000	103	160,000	131
21,000	76	49,000	104	165,000	132
22,000	77	50,000	105	170,000	133
23,000	78	51,000	106	175,000	134
24,000	79	52,000	107	180,000	135
25,000	80	53,000	108	185,000	136
26,000	81	54,000	109	190,000	137
27,000	82	55,000	110	195,000	138
28,000	83	60,000	111		
29,000	84	65,000	112		

30,000	85	70,000	113	
31,000	86	75,000	114	
32,000	87	80,000	115	

b. Roadway Pavement Work (Normal Working Hours): 30 consecutive calendar days will be allowed the first $5,000 of each Task Order; One additional calendar day will be allowed for each additional $1,000 up to $55,000; one additional calendar day will be allowed for each $5,000 (or any part thereof) thereafter. Performance time for Task Orders in excess of $195,000 will be extrapolated by adding one calendar day for each $5,000, (or any part thereof). Refer to TABLE 1b below. Liquidated damages, at the specified rate, may be applied, at the discretion of the Contracting Officer, to individual Task Orders with no adjustment in the contract unit prices paid the contractor for services rendered.

TABLE 1b: PERFORMANCE TIME ROADWAY PAVEMENT WORK

DOLLAR AMOUNT	CALENDAR DAYS	DOLLAR AMOUNT	CALENDAR DAYS	DOLLAR AMOUNT	WORK DAYS
1st 5,000	30	29,000	54	60,000	81
6,000	31	30,000	55	65,000	82
7,000	32	31,000	56	70,000	83
8,000	33	32,000	57	75,000	84
9,000	34	33,000	58	80,000	85
10,000	35	34,000	59	85,000	86
11,000	36	35,000	60	90,000	87
12,000	37	36,000	61	95,000	88
13,000	38	37,000	62	100,000	89
14,000	39	38,000	63	105,000	90
15,000	40	39,000	64	110,000	91
16,000	41	40,000	65	115,000	92
17,000	42	41,000	66	120,000	93
18,000	43	42,000	67	125,000	94
19,000	44	43,000	68	130,000	95
20,000	45	44,000	69	135,000	96
21,000	46	45,000	70	140,000	97
22,000	47	46,000	71	145,000	98
23,000	48	47,000	72	150,000	99
24,000	49	48,000	73	155,000	100
25,000	50	49,000	74	160,000	101
26,000	51	50,000	75	165,000	102
27,000	52	51,000	76	170,000	103
28,000	53	52,000	77	175,000	104
		53,000	78	180,000	105
		54,000	79	185,000	106

	55,000	80	190,000	107
			195,000	108

3.3.5 Special Provisions For Measurements:

3.3.5.1 Quantity Takeoff: Within 5 days of being notified of a new project, the contractor shall be required to examine the drawings, visit the site or both, as appropriate, and submit to the Contracting Officer a proposal containing the unit priced bid items and their quantities necessary to complete the work as shown or as indicated. The contractor's proposed unit priced bid items and their associated quantities shall be determined using measurements taken from the provided drawings and, as necessary, using field measurements, taken at the site. In the absence of drawings, the contractor will be provided a detailed description of the proposed work and must perform measurements in the field to determine the quantities of each unit priced bid item necessary to complete the work as described. Measurements, whether taken from prepared drawings, from the field, or both, shall be made in strict accordance with the "Measurement" paragraphs contained herein. Formal site visits will be held when requested by either the contractor or the Government. Differences between the contractor's independently prepared proposal and the Government estimate will be resolved through negotiations with the Contracting Officer. Once agreement has been reached, a firm-fixed price Task Order containing the negotiated unit priced bid items, their quantities, and the performance time will be issued to the contractor. No changes to the negotiated quantities will be made and no additional unit priced bid items will be added unless differing site conditions are encountered and the drawings and/or description of the work is modified by the Contracting Officer to accommodate the differing site condition(s) encountered. The contractor is responsible for notifying the Contracting Officer immediately upon encountering differing site conditions.

3.3.5.2 Performance Time: Performance time for each "Task Order" will be assigned by the Contracting Officer in accordance with "allotted performance time" paragraph above.

3.3.6 Inspection and Acceptance: Inspections and final acceptance will be made on each separate "Task Order" as completed by the contractor with the following additional provisions:

a. The contractor shall make sure that the work is ready for all inspections. The presence of an unreasonable number of deficiencies, as determined by the Contracting Officer's representative, may cause the inspection to be rescheduled.

b. Upon successful completion of the final inspection, the contractor will be given a list of outstanding discrepancies, if any, which upon correction of any discrepancies listed, will serve as a notice of acceptance by the Contracting Officer's representative for each successfully completed "Task Order." The list will be signed by the Contracting Officer or his representative. One copy of the list will be given to the contractor. The contractor's invoice for final payment will not be honored until all listed discrepancies have been corrected.

3.3.7 Manning:

3.3.7.1 Superintendent: The contractor shall maintain a full-time superintendent physically on Sheppard AFB to serve as the Government point of contact at all times work is being conducted under this contract. The superintendent shall be responsible for the conduct of all work underway. A superintendent need not be designated for each deliver order, as the designated superintendent will be permitted to oversee Task Orders which run concurrent.

3.3.7.2 Crews: The contractor is required to have, on hand or readily available, sufficient crews to meet his obligation to provide delivery of the work under contract within the time(s) allocated.

3.3.8 Deteriorated Construction and Finish: The Contracting Officer will be the governing authority in determining if existing construction and finishes are deteriorated and require repair and/or replacement. The contractor shall not perform any work under this contract without a receipt of an authorized "Task Order" from the Contracting Officer.

3.3.9 Occupied Areas: The work to be performed on this project will include work in occupied facilities and the contractor shall phase his work to comply with the phasing requirements of this specification. Contractor shall coordinate the work of all activities whereby both the Government and the contractor can continue operations with the least possible interference and inconvenience. The contractor shall conduct all work such that means of ingress and egress from any facility are maintained. The contractor shall be responsible for furnishing, installing, and maintaining suitable, approved barricades, roped barriers, etc. to warn occupants of hazardous areas at the jobsite for the duration of the contract at no additional cost to the Government. When laydown machines, trucks, or other heavy equipment are operating on a pavement surface (exclusive of Airfield Pavements) which has not been closed to vehicular traffic, the contractor shall furnish sufficient flagmen, as determined by the Contracting Officer, to control traffic.

3.3.10 Work on the Airfield:

a. The contractor shall provide and install barricades and warning lights as required by subparagraph h., herein.

b. Operators of powered mobile equipment must remain with equipment at all times the equipment is on taxiways or within the distances indicated below and must be prepared to remove the equipment from the area should an emergency situation occur.

c. No towed or powered mobile equipment shall be stored or left without an operator and no storage of material will be permitted within 150 feet of the near edge and 250 feet of the far edge of taxiways or 1000 linear feet of the active runway centerline.

d. The contractor shall provide sufficient two-way radio transceivers with operators for the purpose of maintaining full time contact with the Sheppard control tower at all times any work is being performed. When necessary the tower will inform the jobsite radio operator of the situation and give instructions to remove all or part of the equipment and personnel from all or part of the work area. "Sufficient radios" is hereby defined as that number necessary to effectively communicate the control tower personnel's instructions to each site where the contractor has personnel and/or equipment at work. Effectiveness of communication will be determined by the Contracting Officer, in coordination with Base Operations, and adjustments in the number of radios shall be made as directed at no additional cost to the Government. The communication frequency shall be 173.4375 MHz or as directed by the Contracting Officer. No separate payment will be made for the provision of radio transceivers.

e. The contractor's radio operators shall not be assigned any additional duties that will interfere with their primary responsibility of maintaining continuous radio contact with control tower personnel and implementing all instructions requiring removal of all or part of the contractor's personnel and/or equipment from all or part of the work area when necessary for aircraft movement. The contractor shall make all radio operators and superintendents available for a training and familiarization period of 2 hours maximum duration at least 48 hours prior to need for the operators. A 72 hour notice will be required by the Government for scheduling training. The Contracting Officer will approve or reject proposed radio operators based on their ability to establish and maintain effective communications with control tower personnel during familiarization period.

f. Drivers/Escort Drivers: All vehicles entering or exiting the Sheppard AFB airfield area shall be equipped with radio transceivers or shall be escorted by vehicles equipped with radio transceivers. Training of drivers and escort drivers for vehicles entering or exiting the airdrome area will be as required by Base Operations and shall be conducted prior to beginning work. The contractor shall allow 1 hour minimum for the required training and provide the Government with a 72 hour notice for scheduling such training.

g. Protection: Runway and/or taxiway light fixtures and structures, manhole structures, and covers, and other appurtenances adjacent to or within any work area shall be protected from damage and shall be masked as necessary to prevent coating or splashing them with bituminous or other materials. Masking of the lights, etc., shall be coordinated with the Base Operations Officer through the Contracting Officer. Masking material shall be removed and if not retained for reuse by the contractor shall be disposed of by and at the expense of the contractor off the confines of Sheppard Air Force Base. The contractor shall be required to keep all paved surfaces of taxiways, aprons, and airfield service roads clean and free of any dirt, stones, construction debris, or foreign objects. The contractor shall be required to immediately sweep and clean these areas as directed by the Contracting Officer or his representative at no additional cost to the Government. Should the contractor fail to

comply with his sweeping responsibilities, the Government may sweep the area and charge any incurred costs to the contractor.

h. The contractor shall furnish, install, and maintain lighted barriers approved by the Contracting Officer at all sites where work is being accomplished. Barriers shall be placed as required to delineate the boundaries of the work. Barrier warning lights shall be amber-yellow in color, battery-operated flashing lights and well maintained. Barriers and lights shall be anchored by sandbagging to prevent overturning and/or displacement. Proposed anchorage shall be approved by the Contracting Officer prior to installation. Low-profile barriers shall be used. Barriers shall meet the requirements set forth in Engineering Technical Letter (ETL) 94-01, Technical Details for Standard Airfield Marking Schemes, Paragraph 5.2, April 4, 1994 and shall be placed as stated therein with the exception that barriers and lights may be spaced at 100 foot intervals:

ETL 94-01 Technical Details for Standard Airfield Marking Schemes, Para 5.2, 4 Apr 1994

"5.2. Barricades: Where pavement markings do not provide adequate definition of closed or hazardous areas, use reflective orange and white colored barricades with amber-yellow lights. All barricades must be anchored or be of sufficient mass to retain an established position where they are placed. Flashing lights must be at least five candelas effective intensity and flash at a rate of from 55 to 75 flashes per minute. Continuous burning of lights must have an effective intensity of 10 candelas. Examples are shown in figure 5.3.

5.2.1. Place barricades at 50 feet (15.240 meters) maximum intervals and use dual markers and lights on corners and ends."

i. When pavement repair/maintenance/construction operations must be accomplished adjacent to active aircraft pavements, the Contracting Officer may require construction of FOD Barriers as shown herein to isolate the construction site from aircraft using the adjacent pavements. If required, FOD Barriers shall be erected prior to work start and shall remain in place until work is completed, whereupon they shall be removed.

j. Access route to project area is limited to that provided to the contractor. Crossing of and travel along taxiways shall be limited to project area, unless otherwise directed. Every effort will be made by the Government to provide the shortest, most convenient access route available for the contractor's use.

k. Noise hazard area conditions exist throughout the airfield area. It shall be the contractor's responsibility to provide personal ear protection for his working force in accordance with EM 385-1-1, para. 32, Apr 81 and change 1, Dec 81.

l. The airfield area is in the vicinity of aircraft operations and the contractor shall exercise care to prevent any construction debris, wrappers, etc. from being blown or otherwise conveyed onto the adjacent active airfield pavement surfaces.

Noncompliance with this requirement will constitute cause for suspension of the work until acceptable measures are taken by the contractor whereupon work may resume.

3.3.11 Separate Bid Items for Airfield and Roadway Work: The specifications and work required for many bid items are virtually identical whether the work is being performed on Airfield pavements or Roadway pavements. The major difference between Airfield work and Roadway work is that Airfield work hours are restricted to weekends and holidays and Roadway work hours are normal work hours. Therefore, work on Airfield pavements and Roadway pavements have been divided into separate work items that is "Airfield pavement" vs. "Roadway pavement". The contractor shall consider any and all added costs associated with the restricted work hours imposed for Airfield work and include those costs in the Airfield pavement Unit Priced Bid Items.

If a bid item has not been divided, and has only "Roadway pavement" designation, this indicates that the bid item is contemplated for use on Roadway pavements only. If a bid item has not been divided, and has only "Airfield pavement" designation, this indicates that the bid item is contemplated for use on Airfield pavements only. For the "Airfield pavement" unit prices established in the bid schedule to be considered "In Effect" and used in the payment computations, the work contained in that bid item **MUST**; a. be performed on the airfield and b. be subjected to the restricted work hours specified for Runway work (Weekends and Federal Holidays Only). When the above conditions are not met, and the work contained in that bid item is a. not performed on the airfield or b. conducted during normal duty hours (0730-1630 hrs, M-F, exclusive of Federal Holidays), the unit prices established in the bid schedule for Roadway pavement will be "In Effect" and will be used in the payment computations.

3.3.12 Approval for Excavation: Prior to performing any excavation, grading, trenching or other operations whereby existing underground utilities may be damaged, the contractor shall obtain a completed AF Form 103, Base Civil Engineering Work Clearance Report (commonly referred to as a Digging Permit) from Civil Engineering. The completed form will list points of contact and telephone numbers for each of the various underground utilities (telephone, water, gas electrical, etc.) existing in the work area. It shall be the contractor's responsibility to notify the points of contact for each utility listed and request that any utilities existing in the work area be marked. The Government (or owner in the case of privately owned utilities such as telephone) will be responsible for marking the location of utilities in the work area. Typically, flags and/or paint will be used to mark the earth and/or pavement to provide semi-permanent identification of the utility location. No indication/marking of the depth of the utility below the existing grade will be provided. The contractor shall allow sufficient time for the Government to accomplish these tasks at no additional cost to the Government. Once the utilities are marked, the contractor shall be responsible for maintaining the flags/paint at their proper location(s). The contractor shall be responsible for the repair of any underground utilities damaged as a result of his work provided that the actual location of the damaged utility is within a lateral zone 3 feet on either side of the Government provided mark indicating the location of that utility. Since depth of the

utility will not be provided, the contractor assumes responsibility for any depth determination necessary.

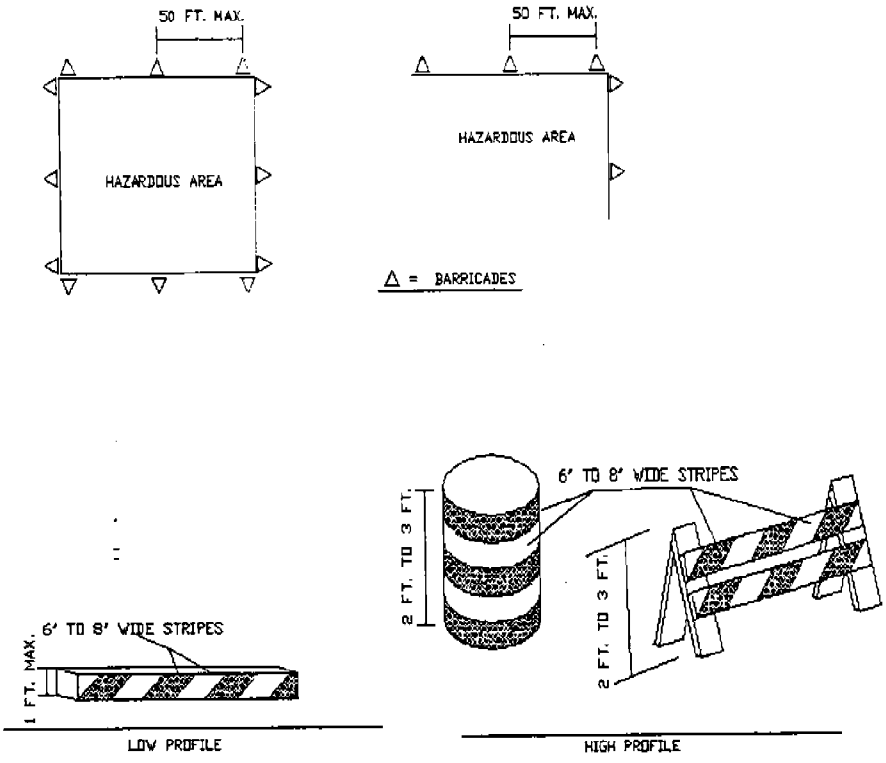

FIGURE 5-3j (ETL 94-01)

4. BASE FIRE REGULATIONS:

4.1 The contractor shall comply with Base Fire Regulations as set forth in 32-2001/SAFB Fire Protection Program, 20 September 1996. The contractor shall use no explosives or fire in performing the work. Contractor shall understand and comply with welding and cutting requirements in AFOSH Standard 91-5, dated Apr 95.

5. ENVIRONMENTAL REQUIREMENTS:

5.1 Compliance With Laws: The contractor shall comply, and assure that all subcontractors comply, with all applicable federal, state, and local laws, regulations, ordinances and standards related to environmental matters. The contractor shall also comply, and assure that all subcontractors comply, with all specific instructions or directions given to the contractor by the Government regarding environmental matters.

5.2 Hazardous Materials: The contractor shall provide the Base Hazardous Materials Management Office (HAZMO) Pharmacy, Bldg. 21, (817) 676-1123 and Base Fire Department, Bldg. 1093, (817(676-2104 (82 CES/CEFS) a written list of all hazardous materials that the contractor will bring onto Government property. The contractor shall further provide a Material Safety Data Sheet (MSDS) for each hazardous chemical listed in OSHA Hazard Communication Standard 29 CFR 1910.1200, March 11, 1994. In addition, the contractor shall observe proper storage practices in accordance with procedures provided by the Environmental Coordinator, Bioenvironmental Engineer, Wing Safety Office and Base Fire Department for hazardous materials stored on base.

5.3 Hazardous and Special Wastes Generated by the Contractor: For all regulated wastes generated, removed or otherwise produced by work required by this project, the contractor shall identify, characterize, containerize, store and dispose of hazardous wastes in strict accordance with federal guidelines found in the Texas Administrative Code, Title 49 (49 CFR) parts 260-270; state guidelines found in the Texas Administrative Code, Title 49 (49 CFR) parts 171-179, Title 30 TAC; Chapter 335, Texas Natural Resource Conservation Commission Industrial Solid and Municipal Hazardous Waste Regulations; all local guidelines; and as specified.

Title 40, 40 CFR part 261-265	May 19, 1980
Title 40, 40 CFR part 267	Feb 13, 1981
Title 40, 40 CFR part 269	May 28, 1986
Title 40, 40 CFR part 266	Jan 4, 1985
Title 40, 40 CFR part 26	May 28, 1986
Title 40, 40 CFR part 270	April 1, 1983

5.3.1 The contractor shall handle asbestos-containing wastes in strict accordance with federal guidelines found in the Code of Federal Regulations, Title 40 (40 CFR) part 61, Subpart M (As revised at 55FR 48414-33, Nov 1990 and corrected at 56 FR 1669, Jan 16, 1991). Friable asbestos waste shall be disposed of as a special waste.

5.3.2 The contractor shall use a Uniform Hazardous Waste Manifest to document all parties and locations involved in the transportation, storage and disposal of all hazardous and special wastes. The contractor shall provide this form to the Government 48 hours prior to shipment.. The manifest shall be signed by the Base Environmental Coordinator before the waste is transported from the limits of Government property. A copy of the manifest shall be signed by the transporter and receiver of the waste. The contractor shall submit the completed form to the Base Environmental Coordinator not later than forty-five days after the waste has been shipped from the base.

5.4 Hazardous and Other Regulated Material Encountered by the Contractor:

5.4.1 The contractor shall notify the Contracting Officer upon discovering any material, not identified in the contract documents, thought to be hazardous to workers or personnel in the area. The Government will be responsible for characterizing, transporting, storing and disposing of the waste if necessary.

5.4.2 Asbestos: To the best of the Government's knowledge, no asbestos-containing material (ACM) will be disturbed by this project. Should the contractor discover previously unidentified or suspected ACM that must be disturbed to comply with the contract documents, the contractor shall cease all work that would disturb the suspect material and shall immediately notify the Contracting Officer. The Government will take steps, as appropriate, to ascertain the material's composition and determine any remedial actions necessary.

5.5 Nuisance and Polluting Activity Prohibited: Polluting, dumping, or discharging of any harmful, nuisance, or regulated materials (such as concrete truck washout, vehicle maintenance fluids, residue from sawcutting operations, solid waste and hazardous substances) into building drains, site drains, streams, waterways, holding ponds or to the ground surface shall not be permitted. The contractor shall be held responsible for any and all damages that may result. Further, the contractor shall conduct activities in such a fashion to avoid creating any legal nuisance, including but not limited to, suppressing noise and dust, controlling erosion, and implementing other measures as necessary to minimize offsite impacts of work activities.

6. SITE MAINTENANCE, CLEANUP, MOWING AND TRIMMING:

6.1 Site Maintenance: The contractor shall protect adjacent property, buildings, and their contents from dust, dirt, or other materials. Contractor is to wet down dry materials, settle debris and prevent blowing dust. The contractor shall maintain work areas in a neat, clean, and safe condition. Work areas shall, at a minimum, be cleaned daily.

6.2 Cleanup: The contractor shall collect all trash, debris, refuse, garbage, etc., which he generates and daily place it in appropriate containers with lids or approved covers. The aforementioned materials shall be hauled from the site by appropriate means daily, unless otherwise approved by the Contracting Officer. Disposal shall be outside the limits of Government property. Disposal shall be at a municipal solid waste landfill or by other approved methods and shall conform to all local, state, and federal guidelines, criteria, and regulations. When work on the airfield is required, aircraft pavement, including taxiways used by the contractor to gain access to the jobsite, shall be left in a clean, swept condition prior to the start of aircraft operations at 0600 hours the first Government workday when the pavement must be returned to service. Unless approved otherwise, all excavations must be filled, ditches filled or covered with approved coverings and the airfield area left in a condition not adverse to safe aircraft operations.

6.3 Mowing and Trimming: The contractor shall perform mowing and trimming operations on his job site or storage site at no additional cost to the Government. Vegetation shall be mowed and trimmed when it reaches a height of five (5) inches. Mowing and trimming shall be to a height of three (3) inches. Mowing shall be accomplished with a rotary mower that leaves the clippings evenly distributed on the soil surface. Mowing shall be accomplished during normal duty hour periods and in such manner that the soil and grass will not be damaged. Towed mowers and self-propelled riding mowers shall not be operated within three (3) feet of trees and shrubs. Areas next to trees and shrubs shall be mowed with hand-propelled mowers.

7. ENERGY CONSERVATION: The contractor shall use good judgment in the conservation of Government utilities. The contractor shall adhere to and enforce prevailing energy conservation practices.

8. RESPONSIBILITY: The above summaries 1 through 7 do not in any way limit the responsibility of the contractor to perform all work and furnish all plant, labor, and materials required by the contract documents referenced herein.

9. STORAGE AND PARKING:

9.1 Contractor storage and parking will be on the paved area at the north end of Bridwell Road, or as designated by the Contracting Officer. No other facilities will be provided by the Government.

9.2 Petroleum Storage: Storage of fuel or petroleum products, whether new or used, will not be permitted at the storage and parking area provided by the Government on Sheppard AFB. Storage of all fuel or petroleum products, if required, shall be conducted off the confines of Sheppard AFB.

9.3 The contractor shall keep the storage and parking area provided free of debris, leaks, stains, or splashes. The storage and parking area shall be maintained in a neat, clean, and safe condition at all times. Any areas that incur contamination by any hazardous substance shall be immediately remediated by the contractor at no additional cost to the Government. Remediation may include subsequent soil analysis if directed by the Government. The contractor shall store all paints, thinners, solvents and other hazardous materials in an approved contractor supplied trailer or storage unit, which shall be secured when not in use.

10. TESTING PARAGRAPHS: All testing indicated in these contract documents to be performed by the government will be performed only at the option of the Government.

11. SAFETY:

11.1 The contractor shall comply with all applicable Air Force Occupational Health and Safety Standards and Regulations. The contractor is also required to comply with the American General Contractors' Safety Manual and the Occupational Safety and Health Act.

11.2 The contractor shall not have or allow glass food or drink containers on the construction site. Glass lined thermal containers are permitted when contained in an appropriate metal or plastic outer shield.

11.3 The contractor must obtain authorization to bring any nonexempt radioactive material (such as density gauges or moisture meters) onto Sheppard AFB by contacting the Nuclear Regulatory Commission, Region IV Office, using the NRC Form 241. Before bringing any radioactive material onto Sheppard AFB, the contractor shall forward a copy of the NRC Form 241 to:

82d Medical Group/SGPB

821 A Avenue

Sheppard AFB TX 76311-3448.

12. PHASING REQUIREMENTS:

12.1 Roadway Pavements:

12.1.1 Zones: When deemed necessary, work within a "Task Order" will be divided into Zones by the Government. The number of Zones contained within a "Task Order" will be determined by the Government based on the difficulty and complexity of the "Task Order" in question.

12.1.2 Work Sequence: Unless waived by the Contracting Officer or adjusted by the Government to suit conditions, work shall be accomplished by Zones in alphabetical or numerical order. Work within a Zone shall be completed entirely before the contractor will be permitted to begin work on the following Zone. Work within a Zone shall be conducted in a logical sequence directed toward the completion of the specified work.

12.1.3 Vehicular Access: Unless it is impractical to do so, work shall be accomplished in such a fashion as to maintain at least one lane accessible to traffic at all times. Unless it is impractical to do so, entrances to drives, cross roads, parking lots, and similar accesses shall remain open at all times. If it is impracticable to maintain roads and accesses open, the contractor will be permitted to close such areas to vehicular traffic, subject to Government approval. The Contracting Officer will determine the practicality of maintaining roads, streets, and drives open to vehicular traffics and that determination is final.

12.1.4 Pavement Closure: Should the contractor desire to close a road, street, drive, or other pavement surface (exclusive of Airfield Pavements) to vehicular traffic, the contractor shall request, in writing, permission to close a particular section of pavement to vehicular traffic. Such request shall clearly identify the section of pavement in question, state the date, time, and approximate duration of the requested closure, and the reason the closure is required. Should the request for pavement closure be approved, the contractor shall allow sufficient time, normally 2-3 weeks, at

no additional cost to the Government, for the Government to coordinate such closure to its satisfaction. Such coordination shall include, but shall not be limited to, publishing articles in the base paper and bulletin to notify base personnel of the impending closure.

12.2 Airfield:

12.2.1 General: After the site visit is completed and prior to starting work on an airfield pavement Task Order the contractor shall submit for approval, a detailed work schedule showing the Government how the work will be accomplished to meet the time constraints required by this contract. Such work schedule is necessary to ensure that if the work is restricted to weekends and holidays, the airfield pavement will be open and ready to safely receive aircraft by 0600 hours the first work day following the weekend or holiday when work was performed. Items required in this work schedule include, but may not be limited to, the following: Extent of work to be accomplished, equipment to be used, manpower available, timing and sequence of work elements, and subcontractors involved. The contractor shall not proceed with any work until the work schedule has been approved by the Contracting Officer. The contractor shall allow at least 10 working days for Government review.

12.2.2 Runways: When work is required on runways, the runway will be closed to aircraft traffic during the work hours set aside for airfield work. Normally the runway can be made available from approximately 2000 hours the Friday evening before the weekend until 0600 hours the Monday morning following the weekend. However, mission requirements may dictate that these hours be curtailed or shortened at no additional cost to the Government. The Government will require a minimum of 72 hour notice of the contractor's intention to work on a specific weekend in order to issue the necessary runway closure orders. Failure to provide the required 72 hour notice to the Government may result in the runway being unavailable and the contractor may be denied access to the runway on the requested weekend, at no additional cost to the Government. The contractor shall provide notification of intention to work directly by telephone to Base Operations and Base Civil Engineering Contracts Section, with follow up notifications in writing. Telephone numbers will be provided after the notice to proceed.

12.2.3 Taxiways: When work is required on taxiways, the entire taxiway or sections of taxiway will be closed to aircraft traffic. Unless waived for individual cases, work on taxiways will be restricted to weekends and holidays and the provisions for work on taxiways will be the same as required above for runways. The Government will evaluate each Task Order on an individual basis and if possible and in the best interest of the Government, work on taxiways will be permitted during the week during normal duty hours. Proper barricades shall be erected by the contractor to clearly indicate closed areas in this case at no additional cost to the Government. Even when these provisions are waived and work is permitted during the week, the contractor will still be required to comply with all other requirements for runway work. FOD Barriers may also be required at these locations.

12.2.4 Aprons and Shoulders: Work on aprons and/or shoulders will be subject to the same requirements as those specified for work on taxiways.

13. TREES, SHRUBS AND HEDGES:

13.1 The contractor shall take appropriate measures to prevent injury to plants in or near the project site unless designated to be removed. The contractor shall not remove or prune any plants without approval from the Contracting Officer or his designated representative.

13.2 Plants that are damaged during construction shall be replaced at no expense to the government and with a 1 year warranty following replacement. Replacement plantings shall be accomplished between November 1 and April 1. Damaged trees shall be replaced with Class I trees, minimum 2" caliper, as defined in Texas Agriculture Extension Service (TAES) Publication L-1683, Evaluation of Texas Shade Trees, June 1987. Damaged shrubs or hedges shall be replaced with plants of equal size, type, and value.

13.3 The Contracting Officer or his designated representative will determine the extent of damage in accordance with National Arborist Association Standards, American Standard for Nursery Stock, TAES Publications L-1683, Evaluation of Texas Shade Trees, and L-1516, Damage Recovery Opportunities for Loss of Landscape Trees, May 1977.

14. TOPSOIL AND MULCH:

14.1 Topsoil shall be obtained from approved off-base sources. The topsoil sources shall be inspected by the Base Agronomist to determine if the selected soils meet the following requirements. The topsoil shall be a sandy loam or sandy clay loam from the top four to six inch layer of soil. Topsoil shall be fertile, friable, natural surface soil, free of subsoil, clods, shale, trash, toxic substances, stones, Johnson grass, all grass from Cyperacae family, or other objectionable and hard to eradicate vegetation. Topsoil shall be a Class II soil as defined by the Soil Conservation Service from the Enterprise, Hardeman, Yahola or Yomont series.

14.2 Mulch shall be ground cypress bark, free from weed seed, soil, plant disease, insects or other objectionable materials. The mulch shall be delivered to the site in unopened bags.

15. Water: Water for use in constructing subgrades, and base courses, and as needed for milling and watering and for other purposes as contained herein will be provided at no charge to the contractor. The contractor may obtain water from fire hydrants nearest the Task Order(s) in progress provided that the special wrench designed for operating fire hydrants is used. Use of pipe wrenches or similar unauthorized means to turn on and off fire hydrants is not permitted. Use of water is strictly limited to that necessary to comply with the requirements contained herein. The contractor shall not waste water.

SECTION 1B

PROJECT SUBMITTALS

1. GENERAL:

1.1 Definitions:

1.1.1 Submittal: A submittal is a package of information, samples, drawings, schedules, certificates, etc., submitted to the Contracting Officer for Government review.

1.1.2 Deviation: A specific submittal where an item is identified as not agreeing with the contract requirements and the contractor is requesting a substitution or change.

1.1.3 Approval/Disapproval: Specific judgments reserved to the Contracting Officer concerning a submittal's compliance with the plans and specifications.

1.2 Purpose: Submittals are directed for the convenience of the Government in reviewing the contractor's planned approach and compliance with the requirements of the contract. It is also a mechanism whereby the contractor may propose deviations, color choices, shop drawings, etc.., at an early point in the contract where changes in approach will have less impact on the materials ordering process.

1.3 Authority: The contractor is wholly responsible for the contents of a submittal. Through the physical act of submitting, the contractor certifies that all items listed or implied, fully meet the intended purpose, functionality, and quality requirements of the plans and specifications, or are submitted as specific deviations thereto.

1.3.1 The contractor shall assure that submittal materials provided, including those provided directly by his suppliers, accurately describe the items in the necessary detail required for a full review.

1.3.2 The submittal of a "system", either as a routine action or as a deviation, shall be considered a submittal of an integrated collection of component parts, each part of which shall be equally bound by paragraphs of this specification.

1.3.3 Any and all deviations from those stated requirements of the plans and specification, shall be identified by the contractor, specifically in writing as a submittal deviation, for either the system as a whole or for a specific item of the whole upon which the deviation is to be exercised. The deviation shall be submitted to the Contracting Officer for review.

2. PROJECT SUBMITTALS:

2.1 Submittals requiring approval of materials shall be submitted to the Contracting Officer well in advance such that the work will not be delayed. Submittals

shall be made by the contractor as a minimum on each specific item addressed in the specifications and drawings.

2.2 Reference: The contractor shall refer to the applicable paragraph in the contract specifications and/or sheet number in chronological order of the contract drawings that requires the submittal.

2.3 At the time of award, the Contracting Officer will furnish AF Form 3000 on which the submittals shall be tabulated. Payment will not be made for any material or equipment that does not comply with contract requirements.

2.4 Submittals shall be submitted in four sets except as otherwise noted. One copy of each drawing and each list will be returned, marked to indicate approval or disapproval.

2.5 A minimum of 7 calendar days shall be allowed for review and approval and possible re-submittal of submittals disapproved by the Government.

2.6 Submittal of Waybills and Delivery Tickets: Since payment for the quantity of each unit priced bid item used in completion of the work will be made at the quantity negotiated and contained in each Task Order, submission of waybills and delivery tickets is not required.

SECTION 1C

SURVEYING

PART 1 - GENERAL

1. SCOPE: This section covers surveying in support of Airfield and Roadway pavement construction, maintenance and repair and for other purposes as determined necessary by the Government. Surveying work required will be as necessary to investigate existing vertical and horizontal alignment in support of design work and establish vertical and horizontal alignment in support of construction work. Work shall be accomplished on Roadway and Airfield pavements and utility systems, and for other purposes as required by the Government.

1.1 For Surveying In Support Of Design Work: The minimum work shall include; verifying coordinates for stations (Survey Monuments), establishing coordinates for corners of facilities, establishing locations of utilities identifiable by surface investigation in relation to facilities or pavements, establishing centerlines of roadways and stations for their appurtenances such as inlets, fire hydrants, drives etc., establishing location and dimensions of roadways, parking lots, sidewalks, slabs and other features within the proposed work area. In addition, the Government may require that elevations be established for any and all of the above listed items as well as ground elevations for preparation of ground contours. The Government may also require that additional survey monuments or benchmarks be established during the course of the work.

1.2 For Surveying In Support Of Construction Work: The minimum work shall include; establishing benchmarks, setting wood stakes, flags or taking other measures for establishing and maintaining vertical and horizontal control during and throughout the construction. In addition, the Government may require that the proper location of poorly located sub-surface utilities be provided to the Government when such utilities are uncovered during the course of the construction work.

2. SUBMITTALS:

2.1 The contractor shall submit, for approval, the name(s) of the company(s) who will function as a Surveying subcontractor(s) in support of this contract. The contractor shall also submit the names, qualifications, and area(s) of responsibility of each person who will be performing surveying work on Sheppard AFB. In addition, the contractor shall submit the name(s) of the Registered Land Surveyors who are responsible for the accuracy and substance of the surveying work provided. Imprints or stampings made from the Registered Land Surveyor(s) seal(s) shall be provided.

2.2 Invoices: Since payment for the quantity of surveying used in completion of the work will be made at the quantity negotiated and contained in each Task Order, submission of itemized invoices showing crew hours expended is not required.

3. EQUIPMENT, TOOLS, AND INSTRUMENTS: Equipment, tools and instruments needed in the performance of the work shall be provided by the contractor,

at no additional cost to the Government, and shall be maintained in a satisfactory working condition at all times, and shall be subject to approval of the Contracting Officer.

4. GENERAL: Surveying work shall be conducted by employees of a Government approved commercial Surveying company regularly engaged in surveying in support of commercial construction.

5. MEASUREMENT:

5.1 Surveying: The quantity of surveying to be paid for will be the negotiated number of crew hours of surveying, as stated in the Task Order.

6. BASIS FOR PAYMENT:

6.1 Surveying: Payment for the quantity of crew hours, determined as specified above, will be made at the appropriate contract unit price per crew hour, as established in the bid schedule for Airfield or Roadway work. Such payment shall constitute full compensation for all labor, materials (including expendable items such as flagging, stakes, etc.), equipment, instruments, overhead, profit, supervision, and incidentals necessary to complete the work.

PART 2 - PRODUCTS

7. MATERIALS AND PERSONNEL:

7.1 SURVEYING CREW(S): The contractor shall provide, as minimum, surveying crew(s) consisting of one (1) party chief, one (1) instrument person, and one (1) rodman or assistant whenever surveying work is being conducted on Sheppard AFB. All members of the crew shall be employees of the Government approved commercial company. The aforementioned three (3) personnel shall constitute one crew. When the entire aforementioned three (3) person crew is engaged in directed surveying work on Sheppard AFB for a period of one hour, that shall constitute the expenditure of one (1) crew hour. Time expended during transit from the home office to Sheppard AFB at the start of the work and from Sheppard AFB to the home office at the completion of the work will not be included for measurement purposes. No separate or additional payment will be made for personnel provided in excess of the stated minimum crew size. For the convenience of the contractor, limited surveying for verifying previously established grades may be conducted by personnel not under the employ of the Government approved commercial surveying company (non-approved personnel), but no separate or additional payment will be made for those personnel, instruments or equipment provided. The use of non-approved personnel is solely an option of the contractor and does in no way limit the contractor's responsibility to provide accurate surveying to the Government.

7.2 Registered Land Surveyor: The surveying firm shall employ a Registered Land Surveyor(s) who shall be responsible for the conduct of the surveying work performed on Sheppard AFB. The work shall be conducted under the supervision of

the Registered Land Surveyor. However, the Registered Land Surveyor need not be a member of the crew specified above and is not required to be physically on Sheppard AFB during the conduct of the directed surveying work. Supervision provided by the Registered Land Surveyor, with all its attendant responsibilities, shall be included in the crew hour price offered the Government and no separate or additional payment will be made for Registered Land Surveyor supervision.

7.3 Accessories: The contractor shall provide, at no additional cost to the Government, wooden stakes, flags, marking tape, and other accessories as may be required to clearly mark the alignment and elevation work conducted.

PART 3 - EXECUTION

8. GENERAL: The work shall be conducted in an expedient and professional manner with the least possible inconvenience to the Government.

9. ACCURACY: The contractor shall be responsible for providing elevations to an accuracy of within 0.05' and alignment to an accuracy of within 10 seconds.

10. COMPUTATIONS: The information gathered through the survey shall comply with all state and local laws governing such work. The Government maintains benchmark information that will be provided to the contractor before execution of the work. The contractor will, however, have the responsibility to determine that the information provided by the Government is accurate before that information is used in the execution of the work. The contractor's computations shall be based on the following:

ZONE NAME: Texas North Central
PROJECTION GROUP: NAD-83, SP Lambert
LINEAR UNITS: Feet
ANGULAR UNITS: Degrees
DATUM NUMBER: NAD-83
STATION: Station ID - Northings and Eastings; Longitude and Latitude
ELEVATION: Mean Sea Level

11. Marking: Wooden stakes shall be accurately sited and be driven well into the ground to provide stability. Wooden stakes shall be tied with high visibility orange tape or painted with high visibility orange paint. Flags shall be accurately sited and maintained straight. The contractor shall be responsible for resiting and reinstalling marking stakes, flags, hubs, etc. which are damaged as a result of construction operations at no additional cost to the Government.

12. DATA: Survey data shall be in a recorded in preprinted field books manufactured specifically for that purpose and shall be in a standard and legible form. If requested by the Government, the survey data shall also be obtained directly from an electronic data collector and recorded in computer files on double sided, high density, 1.44mb computer discs. Immediately upon completion of the field work, the contractor

shall provide to the Government copies (either hard copies or computer files on discs or both as requested) of all survey data obtained during Government approved surveys.

SECTION 1D

CONTRACTOR QUALITY CONTROL

1. SCOPE: This section covers the quality control inspection, sampling, and testing of all supplies, services, and/or workmanship required to be performed by the contract drawings, specifications, and requirements. The contractor shall perform all quality control inspection and/or testing required by this contract (unless specifically designated in this section to be performed by the Government) and shall be responsible for reviewing the contract drawings and specifications and ensuring that all materials and/or procedures used comply with the approved AF Form 3000's.

2. INSPECTION AND TESTING: The contractor shall inspect and test all materials and operations, including but not limited to, the following:

(1) ENVIRONMENTAL PROTECTION:

(a) Location and construction of storage buildings.

(b) Erosion control.

(c) Restoration of construction areas.

(d) Water pollution protection.

(e) Dust control.

(f) Maintenance and clean-up of storage area/jobsite(s).

(2) PROJECT SUBMITTALS:

(a) Ensure all procedures and materials requiring submission for Government approval are submitted in a timely manner such that the work is not delayed.

(3) SURVEYING:

(a) Approval of Surveying company.

(b) Ensure that all surveying for which payment is required under this specification is approved for accomplishment prior to starting work.

(c) Data submission.

(d) Submission of billing records (invoices).

(4) DEMOLITION:

(a) Submit proposed demolition and disposal procedures and obtain written approval prior to starting work.

(b) Coordinate demolition work with other work in progress.

(c) Protect buildings, vegetation, and finishes not designated for demolition from damage.

(d) Protect personnel and vehicles from injury or damage during the course of demolition work.

(e) Erect and maintain specified barricades.

(f) Extent of demolition and degree of removal.

(g) Disposition of salvage material and scrap.

(h) Cleanup.

(5) EXCAVATION AND PREPARATION OF SUBGRADE:

(a) Approval of equipment.

(b) Material conformance.

(c) Utility trenches under paved areas:

1. Compaction test (optimum moisture-density curve), and gradation and Atterberg limits for soil classification. (Tests required: None, use flowable fill or concrete fill.)

2. In-place moisture-density tests. (Tests required: None: Use flowable fill or concrete fill.)

(d) Utility trenches under grassed areas:

1. Compaction test (optimum moisture-density curve), and gradation and Atterberg limits for soil classification. (Tests required: One each, for each type of soil or combination of materials and one test for each 1,000 cubic yards of material thereafter.)

2. In-place moisture-density tests. (Tests required: One per 1,000 linear feet of trench each 12-inch lift of compacted material or fraction thereof.)

3. Check tests, in-place moisture-density. (Tests Required: One per 5,000 linear feet compacted material each 12 inch lift of compacted material or fraction thereof.

(e) Compacted subgrade under paved areas (pavement, curb and gutter, valley gutter or sidewalks):

1. Compaction test (optimum moisture/density curve), and gradation and Atterberg limits for soil classification. (Tests required: One each, for each type of soil, location, or combination of materials.)

2. In-place moisture-density tests. (Tests required: One per 1,000 square yards of compacted material each 6-inch lift of compacted material or fraction thereof.)

3. Check tests, in-place moisture-density. (Tests Required: One per 5,000 square yards compacted material each 6 inch lift of compacted material or fraction thereof.

4. Smoothness test on finished subgrade.

5. Repair/recompact existing subgrade.

(6) LIME-STABILIZED SUBGRADE:

(a) Approval of equipment.

(b) Material conformance.

(c) Utility trenches under paved areas:

1. Compaction test (optimum moisture-density curve), and gradation and Atterberg limits for soil classification. (Tests required: None, use flowable fill or concrete fill.)

2. In-place moisture-density tests. (Tests required: None: Use flowable fill or concrete fill.)

(d) Lime-stabilized subgrade under paved areas (pavement, curb and gutter, or valley gutter):

1. Sampling of materials as required to ensure sufficient quantities to perform mix design.

2. Mix design. (Tests required: One each, for each type of soil or combination of materials and one test for each 3,000 cubic yards of material thereafter.)

3. Compaction test (optimum moisture/density curve), and gradation and Atterberg limits for soil classification. (Tests required: One each, for each type of soil, location, or combination of materials and one test for each 1,000 cubic yards of material thereafter.)

4. Unconfined Compression Tests. (Tests required: Three for each mix design.)

5. In-place moisture-density tests. (Tests required: One per 1,000 square yards of stabilized material each 6-inch lift of stabilized material or fraction thereof.)

6. Check tests, in-place moisture-density. (Tests Required: One per 5,000 square yards stabilized material each 6 inch lift of stabilized material or fraction thereof.

7. Inspection of underlying course.

8. Thickness tests. (Tests Required: One per 1,000 square yards stabilized material each 6 inch lift of stabilized material or fraction thereof.

9. Smoothness test on finished lime-stabilized subgrade.

10. Grade control.

11. Calibration and application of bituminous curing materials.

(7) GRADED-CRUSHED-AGGREGATE BASE COURSE:

(a) Approval of equipment.

(b) Material conformance.

(c) Graded-crushed-aggregate base course under paved areas (pavement, curb and gutter, or valley gutter):

1. Compaction test (optimum moisture/density curve), and gradation and Atterberg limits for soil classification. (Tests required: One each, for each type or combination of materials and one test for each 3,000 tons of material thereafter.)

2. In-place moisture-density tests. (Tests required: One per 200 tons of graded-crushed-aggregate material, or fraction thereof.)

3. Check tests, in-place moisture-density. (Tests Required: One per 1,000 tons of graded-crushed-aggregate material, or fraction thereof.

4. Inspection of underlying course.

5. Smoothness test on finished graded-crushed-aggregate base course.

6. Grade control.

7. Proof rolling.

8. Repair/recompact existing base course.

(8) BITUMINOUS COURSES FOR PAVEMENTS (CENTRAL-PLANT, HOT-MIX):

(a) Approval of equipment.

(b) Material conformance.

(c) HMAC pavement courses roadway and airfield.

1. Sampling of materials as required to ensure sufficient quantities to perform mix design(s), (Job Mix Formula).

2. Marshall Mix design. (Tests required: One each, for each compaction effort specified, i.e., 50 blow, 75 blow and one test for each 4,000 tons of each material thereafter).

3. Aggregate gradation. (Tests required: Four each, for 500 ton lot of each material, i.e., 50 blow, 75 blow HMAC pavement installed).

4. Asphalt content. (Tests required: Four each, for 500 ton lot of each material, i.e., 50 blow, 75 blow HMAC pavement installed).

5. Laboratory Density. (Tests required: Four determinations for each 500 ton lot of each material, i.e., 50 blow, 75 blow HMAC pavement installed. Average will be laboratory density).

6. Field Density. (Tests required: Eight determinations for each 500 ton lot, or fraction thereof, of each material, i.e., 50 blow, 75 blow HMAC pavement installed. 4 joint and 4 mat field density tests each lot).

7. Grade conformance tests.

8. Surface smoothness test.

(9) BITUMINOUS PRIME COAT:

(a) Approval of equipment.

(b) Material conformance.

(c) On areas to receive HMAC pavement:

1. Preparation of surface.

2. Calibration of application equipment

3. Application of bituminous material.

(10) BITUMINOUS TACK COAT:

(a) Approval of equipment.

(b) Material conformance.

(c) On areas to receive HMAC pavement:

1. Preparation of surface.

2. Calibration of application equipment

3. Application of bituminous material.

(11) JOINT AND CRACK SAWING, SEALING AND RESEALING IN PAVEMENTS:

(a) Approval of equipment.

(b) Material conformance.

(c) Bituminous pavements.

1. Cracks routed, cleaned, and sealed.

2. Detail "A" routed, cleaned, and sealed.

(d) Concrete pavements.

1. Cracks routed, cleaned, and sealed.

2. Joints routed, cleaned, and sealed.

3. Pavement repairs accomplished if required.

4. Detail "B" routed, cleaned, and sealed.

5. Detail "C" routed, cleaned, and sealed.

6. Detail "D" formed, and cleaned.

7. Testing on Sealant for Airfield use.

(12) HMAC PAVEMENT REPAIR

(a) Approval of equipment.

(b) Material conformance.

(c) Testing as required in SECTIONS: GRADED-CRUSHED-AGGREGATE BASE COURSE, CONCRETE, GENERAL REQUIREMENTS, and BITUMINOUS COURSES FOR PAVEMENTS (CENTRAL-PLANT HOT-MIX) herein.

(d) Identification of failed areas requiring repair.

(e) Approval of subgrade/base course.

(f) Prime coat.

(g) Tack coat.

(h) Smoothness test.

(13) BITUMINOUS SURFACE TREATMENT.

(a) Approval of equipment.

(b) Material conformance.

(c) Surface preparation.

(d) Calibration of application equipment.

(e) Emulsion application rates.

(f) Aggregate application rates.

(g) Brooming and rolling.

(h) Application of fog seal emulsion coat if required.

(14) ASPHALT PAVEMENT RECYCLING USING CLASS "C" FLY ASH

(a) Approval of equipment.

(b) Material conformance.

(c) Approval of construction plan.

(d) Sampling of pulverized materials as required to ensure sufficient quantities to perform mix design.

(e) Mix Design. (Tests required: One each, for each task order.)

(f) Laboratory Density. (Tests required: One each, for each mix design.)

(g) Unconfined laboratory compression testing. (Tests required: Three each, for each mix design.)

(h) Field compressive strength. (Tests required: Four each, for each 5,000 square yard lot.)

(i) Field moisture content tests. (Tests required: As necessary to ensure compliance with this specification.)

(j) Ensure accurate stationing of area and distribution of fly ash.

(k) Calibration of equipment.

(l) Thickness tests. (Tests required: One each, for each 5,000 square yards of recycled pavement area, if required.)

(m) Smoothness tests of finished course.

(15) PAVEMENT MARKINGS:

(a) Approval of equipment.

(b) Material conformance.

(c) Manufacturer's training.

(d) Layout.

(e) Calibration of equipment.

(f) Installation.

(16) STORM-DRAINAGE PIPING:

(a) Approval of equipment.

(b) Materials conformance.

(c) Testing as required in SECTIONS: EXCAVATION AND PREPARATION OF SUBGRADE, and CONCRETE, GENERAL REQUIREMENTS herein.

(d) Excavation, trenching and bedding.

(e) Placement of pipe.

(f) Grade and alignment of piping.

(g) Construction of drainage structures.

(h) Disposition of excessive materials.

(i) Establishment of turf.

(17) ESTABLISHMENT OF TURF:

(a) Approval of equipment.

(b) Materials conformance.

(c) Maintenance of seeded/hydromulched/sodded areas.

(d) Mowing.

(e) Watering.

(18) SPRINKLER HEADS:

(a) Materials conformance.

(b) Initial operational testing.

(c) Final operational testing.

(19) RUBBER AND PAINT REMOVAL:

(a) Approval of equipment.

(b) Clean-Up.

(20) REFLECTIVE CRACK MAINTENANCE PRODUCT:

(a) Approval of equipment.

(b) Materials conformance.

(c) Surface preparation.

(d) Installation and rolling.

(21) CONCRETE, GENERAL REQUIREMENTS:

(a) Approval of equipment.

(b) Materials conformance.

(c) Concrete mix design. (Tests required: One each, for each strength of concrete specified, i.e., 4,000 PSI and 5,000 PSI and one test for each 1,000 cubic yards of material thereafter).

(d) Concrete field compressive strength. (Tests required: Four cylinders for two strength tests at 28 days age for each mix design, each day's placement and each 20 cubic yards thereafter. Two cylinders held in reserve.)

(e) Flowable fill field compressive strength. (Tests required: None).

(f) Concrete slump tests. (Tests required: One each, for each mix design, each day's placement and each 20 cubic yards thereafter).

(g) Concrete air content tests. (Tests required: One each, for each mix design, each day's placement and each 20 cubic yards thereafter).

(h) Flowable fill field consistency. (Tests required: One each, for each delivery of materials.)

(i) Condition of underlying course.

(j) Temperature requirements.

(k) Placement of reinforcing steel.

(l) Protection against freezing.

(m) Curing.

(n) Jointing.

(22) MISCELLANEOUS CONCRETE STRUCTURES:

(a) Approval of equipment.

(b) Materials conformance.

(c) Forms set accurately.

(d) Placement of reinforcing steel.

(e) Rings and covers and/or rings and grates set accurately.

(f) Grade control.

(23) CONCRETE PAVEMENT:

(a) Approval of equipment.

(b) Materials conformance.

(c) Testing as required in SECTIONS: EXCAVATION AND PREPARATION OF SUBGRADE, LIME-STABILIZED SUBGRADE, GRADED-CRUSHED-AGGREGATE BASE COURSE, JOINT AND CRACK SAWING, SEALING AND RESEALING and CONCRETE, GENERAL REQUIREMENTS herein.

(d) Condition of underlying courses.

(e) Surface smoothness.

(f) Grade conformance.

(g) Placement of reinforcing steel.

(h) Thickness evaluation. (Tests required: One core, for each 5,000 square yards of concrete pavement installed).

(i) Surface deficiencies.

(j) Temperature requirements.

(k) Protection against freezing.

(l) Placement of reinforcing steel.

(m) Curing.

(n) Texturing and finishing.

(o) Jointing.

(p) Sealing.

(24) FLOWABLE FILL:

(a) Approval of equipment.

(b) Materials conformance. Flowable fill design. (Tests required: One each, for each mix design and one test for each 1,000 cubic yards of material thereafter).

(c) Proper mix design.

(d) Forms set as needed.

(25) CONCRETE PAVEMENT REPAIR:

(a) Approval of equipment.

(b) Materials conformance.

(c) Testing as required in SECTIONS: GRADED-CRUSHED-AGGREGATE BASE COURSE, JOINT AND CRACK SAWING, SEALING AND RESEALING and CONCRETE, GENERAL REQUIREMENTS herein.

(d) Identification of failed areas requiring repair.

(e) Approval of subgrade/base course.

(f) Surface smoothness.

(g) Temperature requirements.

(h) Protection against freezing.

(i) Placement of reinforcing steel.

(j) Installation of bonding agent.

(k) Installation of bond breaker.

(l) Curing.

(m) Texturing and finishing.

(n) Jointing.

(o) Sealing.

(26) CONCRETE SIDEWALKS, CURBS AND GUTTERS, AND VALLEY GUTTERS:

(a) Approval of equipment.

(b) Materials conformance.

(c) Testing as required in SECTIONS: EXCAVATION AND PREPARATION OF SUBGRADE, LIME-STABILIZED SUBGRADE, GRADED-CRUSHED-AGGREGATE BASE COURSE, JOINT AND CRACK SAWING, SEALING AND RESEALING and CONCRETE, GENERAL REQUIREMENTS herein.

(d) Condition of underlying courses.

(e) Surface smoothness.

(f) Grade conformance.

(g) Surface deficiencies.

(h) Temperature requirements.

(i) Protection against freezing.

(j) Placement of reinforcing steel.

(k) Curing.

(l) Texturing and finishing.

(m) Jointing.

(n) Sealing.

(o) Color matching.

(p) Power washing.

(27) ELECTRICAL REQUIREMENTS:

(a) Materials conformance.

(b) Electrical Code Compliance.

(c) Proper functioning of lighting circuits, lamps, luminaires and traffic signal loops.

(d) Proper installation of street light poles (plumbness).

(e) Proper placement of aircraft tie-downs.

(f) Testing duct bank bedding, fill and backfill as required in SECTIONS: EXCAVATION AND PREPARATION OF SUBGRADE herein.

(g) Excavation, trenching and bedding.

(h) Placement of conduits.

(i) Grade and alignment of conduits.

(j) Disposition of excessive materials.

(k) Establishment of turf.

3. RECURRING DEFICIENCIES: If, in the opinion of the Contracting Officer, recurring deficiencies in an item or items being inspected by the contractor indicate that the inspection system is not providing adequate quality control the contractor shall take such corrective measures as deemed necessary by the Contracting Officer, at no additional cost to the Government.

4. BASIS FOR PAYMENT: No separate payment will be made for the contractor's quality control inspection performed under this contract.

SECTION 2A

DEMOLITION

PART 1 - GENERAL

1. SUBMITTALS: The contractor shall submit proposed demolition and disposal procedures to the Contracting Officer and obtain written approval before work is started. Procedures shall provide for coordination with other work in progress, a detailed description of methods and equipment to be used for each operation and of the sequence of operations.

2. GENERAL REQUIREMENTS: The work includes demolition and disposal of bituminous hot-mixed pavements, concrete pavements, concrete stand-up curb, concrete curb and gutter, concrete valley gutter and shall also include miscellaneous sawcutting of pavement. All materials, including those generated by the cold-milling pavement demolition process, resulting from demolition work shall become the property of contractor and shall be removed from the limits of Government property and disposed of on a daily basis at no additional cost to the Government.

3. DUST CONTROL: Take appropriate action as directed to check the spread of dust and to avoid the creation of a nuisance in the surrounding area. Do not use water if it results in hazardous or objectionable conditions, such as ice, flooding or pollution. Comply with all dust regulations imposed by local air pollution agencies.

4. PROTECTION:

4.1 Buildings, Pavements and Other Structures: Protect existing work that is to remain in place, that is to be reused, or that is to remain the property of the Government. Repair items damaged during performance of the work or replace with new.

4.2 Personnel: Where pedestrian and driver safety is endangered in the area of demolition, provide approved barricades as directed.

5. BURNING: The use of burning for disposal of refuse and debris will not be permitted.

6. EXPLOSIVES: Use of explosives will not be permitted.

7. DISPOSITION OF MATERIAL:

7.1 Title to Materials: Title to all materials generated as a result of demolition and removal operations is vested in the contractor.

8. CLEANUP:

8.1 Debris and Rubbish: Remove and transport debris and rubbish in a manner that will prevent spillage on streets or adjacent areas. Clean up spillage from streets and adjacent areas.

8.2 Regulations: Comply with federal, state, and local hauling and disposal regulations.

9. MEASUREMENT:

9.1 Stand-Up Curb Demolition: The quantity of stand-up curb demolition to be paid for will be the negotiated number of linear feet of stand-up curb demolition, as stated in the Task Order.

9.2 Curb and Gutter Demolition: The quantity of curb and gutter demolition to be paid for will be the negotiated number of linear feet of curb and gutter demolition, as stated in the Task Order.

9.3 Valley Gutter Demolition: The quantity of valley gutter demolition to be paid for will be the negotiated number of linear feet of valley gutter demolition, as stated in the Task Order.

9.4 Sidewalk Demolition: The quantity of sidewalk demolition to be paid for will be the negotiated number of square yards of sidewalk demolition, as stated in the Task Order.

9.5 Concrete Pavement Demolition: The quantity of concrete demolition to be paid for will be the negotiated number of cubic yards of concrete pavement demolition contained in full depth repairs or other concrete pavement demolition, as stated in the Task Order. No differentiation will be made between reinforced or non-reinforced concrete and volume of concrete demolished during spall repair will not be included in these measurements.

9.6 Concrete Bumper Block Demolition: The quantity of concrete bumper block demolition to be paid for will be the negotiated number of concrete bumper block demolition, as stated in the Task Order.

9.7 Valve Box Repositioning: The quantity of valve box repositioning to be paid for will be the negotiated number of valve boxes repositioning, as stated in the Task Order.

9.8 Miscellaneous Concrete Structure Demolition: The quantity of miscellaneous concrete structure demolition to be paid for will be the negotiated number of cubic yards of miscellaneous concrete structure demolition, as stated in the Task Order. No differentiation will be made between reinforced or non-reinforced concrete.

9.9 Street Sign Post Removal and Reinstallation: The quantity of street sign post removal and reinstallation to be paid for will be the negotiated number of street sign post removal and reinstallation, as stated in the Task Order.

9.10 Salvage and Reinstallation of Existing Ring and Cover and/or Grate: The quantity of salvage and reinstallation of existing ring and cover and/or grate to be paid for will be the negotiated number of salvage and reinstallation of ring and cover and/or ring and grate, as stated in the Task Order.

9.11 Bituminous Pavement Surface Demolition:

9.11.1 Bituminous Pavement Surface Demolition (By Means Other Than Cold-Milling): The quantity of bituminous pavement surface demolition (by means other than cold-milling) to be paid for will be the negotiated number of square yards of each thickness range of bituminous pavement surface demolition by mechanical means other than cold-milling, as stated in the Task Order.

9.11.2 Bituminous Pavement Surface Demolition (By Means Of Cold-Milling): The quantity of bituminous pavement surface demolition (by means of cold-milling) to be paid for will be the negotiated number of square yards of bituminous pavement surface demolition by means of cold-milling, as stated in the Task Order.

9.11.3 Mobilize and Demobilize Cold-Milling Equipment: The quantity of mobilize and demobilize cold-milling equipment to be paid for will be the negotiated number of mobilize and demobilize cold-milling equipment for cold-milling work, as stated in the Task Order. The Government may require that cold-milling be accomplished on several concurrent Task Orders with one mobilization/demobilization event. The Government shall be permitted at least one Government directed down day (days when cold-milling operations are suspended), not including weekends or holidays, between each mobilization/demobilization event.

9.12 Bituminous Pavement Sawcutting: The quantity of bituminous pavement sawcutting to be paid for will be the negotiated number of linear feet of each depth range of bituminous pavement sawcutting, as stated in the Task Order.

9.13 Concrete Pavement Sawcutting: The quantity of concrete pavement sawcutting to be paid for will be the negotiated number of linear feet of each depth range of concrete pavement sawcutting, as stated in the Task Order.

9.14 Concrete Curb and Gutter Sawcutting: The quantity of concrete curb and gutter sawcutting to be paid for will be the negotiated number of concrete curb and gutter sawcutting, as stated in the Task Order. Concrete curb and gutter sawcutting consists of a cross-cut completely through the an existing curb and gutter section during demolition.

9.15 F.O.D. Barrier: The quantity of F.O.D. Barrier to be paid for will be the negotiated number of linear feet of F.O.D. Barrier, as stated in the Task Order, including erection and removal.

10. BASIS FOR PAYMENT:

10.1 Stand-Up Curb Demolition: Payment for the quantity of stand-up curb demolition determined as specified above, will be made at the contract unit price per linear foot as established in the bid schedule for Roadway work. Such payment shall constitute full compensation for all labor, equipment, overhead, profit, supervision, and incidentals necessary to complete the work.

10.2 Curb and Gutter Demolition: Payment for the quantity of curb and gutter demolition determined as specified above, will be made at the contract unit price per linear foot as established in the bid schedule for Roadway work. Such payment shall constitute full compensation for all labor, equipment, overhead, profit, supervision, and incidentals necessary to complete the work.

10.3 Valley Gutter Demolition: Payment for the quantity of valley gutter demolition determined as specified above, will be made at the contract unit price per linear foot as established in the bid schedule for Roadway work. Such payment shall constitute full compensation for all labor, equipment, overhead, profit, supervision, and incidentals necessary to complete the work.

10.4 Sidewalk Demolition: Payment for the quantity of sidewalk demolition determined as specified above, will be made at the contract unit price per square yard as established in the bid schedule for Roadway work. Such payment shall constitute full compensation for all labor, equipment, overhead, profit, supervision, and incidentals necessary to complete the work.

10.5 Concrete Pavement Demolition: Payment for the quantity of concrete pavement demolition determined as specified above, will be made at the appropriate contract unit price per cubic yard as established in the bid schedule for Airfield or Roadway work. Such payment shall constitute full compensation for all labor, equipment, overhead, profit, supervision, demolition of reinforcing steel, and incidentals necessary to complete the work.

10.6 Concrete Bumper Block Demolition: Payment for the quantity of concrete bumper block demolition determined as specified above, will be made at the contract unit price per each as established in the bid schedule for Roadway work. Such payment shall constitute full compensation for all labor, equipment, overhead, profit, supervision, and incidentals necessary to complete the work.

10.7 Valve Box Repositioning: Payment for the quantity of valve box repositioning determined as specified above, will be made at the contract unit price per each as established in the bid schedule for Roadway work. Such payment shall constitute full compensation for all labor, equipment, overhead, profit, supervision, and incidentals necessary to complete the work.

10.8 Miscellaneous Concrete Structure Demolition: Payment for the quantity of miscellaneous concrete structure demolition determined as specified above, will be made at the appropriate contract unit price per cubic yard as established in the bid schedule for Airfield or Roadway work. Such payment shall constitute full

compensation for all labor, equipment, overhead, profit, supervision, demolition of reinforcing steel and incidentals necessary to complete the work.

10.9 Street Sign Post Removal and Reinstallation: Payment for the quantity of street sign post removal and reinstallation determined as specified above, will be made at the contract unit price per each as established in the bid schedule for Roadway work. Such payment shall constitute full compensation for all labor, materials (including new concrete for footing) equipment, overhead, profit, supervision, and incidentals necessary to complete the work.

10.10 Salvage and Reinstall Existing Ring and Cover and/or Grate: Payment for the quantity of salvage and reinstall existing ring and cover and/or grate determined as specified above, will be made at the appropriate contract unit price per each as established in the bid schedule for Airfield or Roadway work. Such payment shall constitute full compensation for all labor, equipment, overhead, profit, supervision, and incidentals necessary to complete the work.

10.11 Bituminous Pavement Surface Demolition:

10.11.1 Bituminous Pavement Surface Demolition (By Means Other Than Cold-Milling): Payment for the quantity of bituminous pavement surface demolition (by means other than cold-milling) determined as specified above, will be made at the appropriate contract unit price per square yard as established in the bid schedule for Airfield or Roadway work. Such payment shall constitute full compensation for all labor, equipment, overhead, profit, supervision, and incidentals necessary to complete the work.

10.11.2 Bituminous Pavement Surface Demolition (By Means Of Cold-Milling): Payment for the quantity of bituminous pavement surface demolition (by means of cold-milling) determined as specified above, will be made at the appropriate contract unit price per square yard as established in the bid schedule for Airfield or Roadway work. Such payment shall constitute full compensation for all labor, equipment, overhead, profit, supervision, and incidentals necessary to complete the work.

10.11.3 Mobilize and Demobilize Cold-Milling Equipment: Payment for the quantity of mobilize and demobilize cold-milling equipment determined as specified above, will be made at the appropriate contract unit price per each as established in the bid schedule for Airfield or Roadway work. Such payment shall constitute full compensation for all labor, equipment, overhead, profit, supervision, and incidentals necessary to complete the work.

10.12 Bituminous Pavement Sawcutting: Payment for the quantity of bituminous pavement sawcutting determined as specified above, will be made at the appropriate contract unit price per linear foot as established in the bid schedule for Airfield or Roadway work. Such payment shall constitute full compensation for all labor, equipment, overhead, profit, supervision, and incidentals necessary to complete the work.

10.13 Concrete Pavement Sawcutting: Payment for the quantity of concrete pavement sawcutting determined as specified above, will be made at the appropriate contract unit price per linear foot as established in the bid schedule for Airfield or Roadway work. Such payment shall constitute full compensation for all labor, equipment, overhead, profit, supervision, and incidentals necessary to complete the work.

10.14 Concrete Curb and Gutter Sawcutting: Payment for the quantity of concrete curb and gutter sawcutting determined as specified above, will be made at the contract unit price per cross cut as established in the bid schedule for Roadway work. Such payment shall constitute full compensation for all labor, equipment, overhead, profit, supervision, including boring for and installing load transfer dowels, and incidentals necessary to complete the work.

10.15 F.O.D. Barrier: Payment for the quantity of F.O.D. Barrier determined as specified above, will be made at the appropriate contract unit price per linear foot as established in the bid schedule for Airfield or Roadway work. Such payment shall constitute full compensation for all labor, materials, equipment, overhead, profit, supervision, and incidentals necessary to complete the work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

11. EXISTING STRUCTURES: Existing structures shall be removed where directed, or specified, to the extent specified herein.

11.1 The contractor shall remove existing concrete stand-up curb at various locations where directed in its entirety. Existing stand-up curb is shown herein.

11.2 The contractor shall remove existing concrete curb and gutter at various locations where directed in its entirety. Existing curb and gutter is similar to new curb and gutter shown herein.

11.3 The contractor shall remove existing concrete valley gutter at various locations where directed in its entirety. Existing valley gutter is similar to new valley gutter shown herein.

11.4 The contractor shall remove existing concrete sidewalk at various locations where directed in its entirety. Existing sidewalk is similar to new sidewalk shown herein.

11.5 The contractor shall remove existing concrete pavement full depth for full depth demolition and to the extent specified in SECTION: CONCRETE PAVEMENT REPAIR for spall repair.

11.6 The contractor shall remove existing concrete bumper blocks at various locations where directed in their entirety. Existing concrete bumper blocks are like those usually encountered and are normally doweled into the underlying pavement.

11.7 The contractor shall raise or lower existing cast iron valve boxes as necessary to bring the valve box to new established grades.

11.8 The contractor shall remove existing concrete miscellaneous structures at various locations where directed in their entirety. Existing concrete structures consist primarily of abandoned building foundations, headwalls, piers, boxes and other miscellaneous concrete, other than concrete pavement, likely to be found during excavation for Airfield or Roadway work.

11.9 The contractor shall remove existing street sign posts in their entirety, including concrete footer, and store them without damage for future reinstallation. Concrete footer shall be removed from posts and new concrete footer shall be placed around the post when reinstalled. Posts shall be set plumb and signs shall be oriented at 90 degrees to the roadway.

11.10 The contractor shall remove without damage those catch basin rings and grates and/or manhole rings and covers identified for salvage. Such salvaged items shall later be reinstalled in the new work in accordance with the plans.

11.11 The contractor shall remove existing bituminous (HMAC) pavement structure, where directed, to the extent indicated below.

11.11.1 Bituminous Surface Removal: When the materials underlying the bituminous surface are required to be resurfaced with new bituminous materials, and pavement recycling is not contemplated, only the existing bituminous surface shall be demolished. Demolition shall be accomplished by cold milling operations, or other mechanical means. If other mechanical means are proposed for bituminous surface removal, the entire bituminous surface must be removed, regardless of thickness, down to the existing base course. If cold milling is proposed for bituminous surface removal, the existing bituminous surface shall be cold-milled to the depth necessary to meet the required new grades, but, unless indicated otherwise, to a minimum 2 inch depth in preparation for the subsequent asphalt course. The following requirements for cold-milling shall be in effect.

11.11.1.1 Cold-Milling Machine: The cold-milling machine shall be a self-propelled machine capable of milling the pavement the proper depth and smoothness. Pavement milling machine shall be capable of establishing grade control; shall have means of controlling transverse slope; and shall have effective means of controlling dust produced during the pavement milling operation. The machine shall have the ability to remove the millings or cuttings from the pavement and load them into a truck. The milling machine shall not cause damage to any part of the pavement structure that is not to be removed.

11.11.1.2 Cold-Milling Operation: Sufficient passes shall be made so that the designated area is milled to the grades and cross sections indicated or specified. The cold-milling shall proceed with care and in depth increments that will not damage the pavement below the designated finished grade. Any items, such as manholes, valve

boxes and utility lines damaged or any pavement that is torn, cracked, gouged, broken, or undercut shall be repaired or replaced as directed, at no additional cost to the Government.

11.11.1.3 Removal of Milled Material: Asphaltic material that is removed shall become the property of the contractor and as such shall be disposed off the confines of Government property at no additional cost to the Government.

11.11.2 Full Depth Removal: When placing curbing adjacent to bituminous pavement to remain, the bituminous pavement structure shall be removed to a depth of 12-15 inches below grade, and width necessary to install forms and construct the new curb and gutter section shown herein. Where bituminous pavement structure is required to be covered with topsoil fill and seeded, the existing base course beneath the bituminous surface shall be demolished to a depth of 6 inches below existing grade or as directed. Payment for demolition of underlying base course after bituminous surface demolition has been accomplished will be made in accordance with the payment clause "Excavation" contained in SECTION: EXCAVATION AND PREPARATION OF SUBGRADE.

12. CUTTING AND SAWING: During the course of demolition work, the contractor will be required to perform miscellaneous cutting and sawing of existing bituminous and concrete pavements. Also, the contractor will be required to make sawcuts through the cross section of existing curb and gutter. Such curb and gutter sawcuts will be required when existing curb has been "feathered" and is not the proper cross section or when deteriorated curb and gutter must be demolished and the deteriorated portion ends at a location other than a control joint.

13. F.O.D. BARRIER: When directed or when demolition and/or construction is conducted adjacent to active airfield pavements, the contractor shall furnish and install a F.O.D. Barrier as shown in the details. F.O.D. Barrier shall be installed prior to the start of demolition/construction and shall be removed when demolition/construction is complete.

SECTION 2B

EXCAVATION, AND PREPARATION

OF SUBGRADE

PART 1 - GENERAL

1. APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

1.1 Military Standards (Mil. Std.):

MIL-STD-619B	15 Mar 95, 12 Jun 68	Unified Soil Classification System for Roads, Airfields, Embankments and Foundations
MIL-STD-621A,	15 Jul 95, Notice 3, 22 Dec 64, Notice 1, 02 Jun 66, Notice 2, 06 Dec 68	Test Method for Pavement Subgrade, Subbase, and Base-Course Materials

1.2 American Society for Testing and Materials (ASTM) Publications:

C I36-84A		Sieve Analysis of Fine and Coarse Aggregates
D 422 E1-63	(R I990)	Particle-Size Analysis of Soils
D 1140-92	1992	Amount of Material in Soils Finer than the No. 200 (75-um) Sieve
D 1556-90	1990	Density of Soil in Place by the Sand-Cone Method
D 2922-91	1991	Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
D 3017-88	(R 1993)	Moisture Content of Soil and Soil-Aggregate In Place By Nuclear Methods (Shallow Depth)

2. DEFINITIONS:

2.1 Earthen Materials: Earthen materials are classified as material located in the ground, which is classified as soil in accordance with the provisions of MIL-STD-619, ASTM C 136, D 422, and D 1140. Such material may be excavated, without the use of explosives, by the use of standard excavating equipment such as chain trenchers, front-end loaders, motor graders, and backhoes. Stones, and rocks that are of a size small enough to be handled, without reduction, by this type equipment will be considered earthen materials.

2.2 Cohesionless and Cohesive Materials: Cohesionless materials include earthen materials classified in MIL-STD-619 as GW, GP, SW, and SP. Cohesive materials include earthen materials classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM and SM will be identified as cohesionless only when the fines are nonplastic. Testing required for classifying materials shall be in accordance with MIL-STD-621, Method 103, ASTM C 136, D 422, and D 1140.

2.3 Degree of Compaction: Degree of compaction required is expressed as a percentage of the maximum dry density obtained by the test procedure presented in MIL-STD-621, Method 100, compaction effort designation CE 55. This will be abbreviated below as a percentage of laboratory maximum dry density.

2.4 Excavation: Excavation or cut is defined as the temporary or permanent removal of earthen material within the area of the jobsite, necessary to complete the Task Order to the plan grades. Excavation or cut may be required when setting plan grades for compacted subgrade, utility lines, storm sewer lines, manholes, curb inlets, and other similar situations.

2.5 Borrow: Borrow is defined as earthen material that is excavated from an area outside the confines of Sheppard AFB required for fill at the jobsite. By definition, borrow requires excavation, purchase and transportation of the material. Borrow shall be composed of either select material, topsoil material, or earthen material depending on the area requiring fill, to meet the requirements specified for fill. Fill for subgrade and for other purposes where fill need not have high organic content as required for top soil, or low plasticity index as required for select fill shall generally be the same type material existing at the site requiring fill as determined by MIL-STD-619.

2.5.1 Borrow For Use As Select Fill: Select fill material shall be a well-graded cohesionless material classified as SW or SP in accordance with MIL-STD-619, and shall have a plasticity index less than 10. Select fill shall be free of debris, weed seeds, and organic material.

2.5.2 Borrow For Use As Topsoil Fill: Topsoil fill material shall be screened sandy loam obtained from within 6 inches from the surface of the soil. Topsoil fill material shall be a fertile, friable, natural, surface soil, free from subsoil, clods, shale,

trash, toxic substances, stones, Bermuda grass, Johnson grass, nut grass, or other objectionable weeds or grasses. Topsoil fill shall be a Class II soil as defined by the Soil Conservation Service from the Devol, Enterprise, Hardeman, Yahola or Yomont series.

2.5.3 Borrow For Use As Earthen Fill: Earthen fill material shall be fill other than select fill or topsoil fill, and shall be generally the same type material existing at the site as determined by MIL-STD-619.

2.6 Fill: Fill is defined as the placement or installation of select, topsoil, or earthen borrow material, generated from borrow operations, to increase grade or elevation of an area to meet the plan grades, fill against curbs, low areas, and to provide bedding and fill for utility trenches, and for other purposes. Fill does involve transportation of material outside the bounds of the project.

2.7 Backfill: Backfill is defined as the placement or reinstallation of Government owned select, topsoil, or earthen material, generated from excavation or cut operations, at the same site where it was obtained. Backfill may be required for filling against structures, filling excavations left from utility line and storm sewer line installation, and for other purposes. Backfill does not involve transportation of material outside the bounds of the project.

3. CLASSIFICATION OF EXCAVATION: Excavation will consist of mainly earthen materials including, pavement base courses, stabilized subgrades, subgrades, and other similar materials. When encountered, excavation of sandstone rock will also be necessary. Excavation and disposal of concrete foundations, concrete slabs or other areas of mass concrete when and if necessary will be measured and paid for in accordance with the provisions defined in SECTION: DEMOLITION.

4. BLASTING: Blasting will not be permitted.

5. UTILIZATION OF EXCAVATED MATERIALS: Excavated materials unsatisfactory for use as backfill shall be disposed of off the limits of Government property at no additional cost to the Government. In so far as possible, all satisfactory excavated materials shall be used for backfill in low areas, used as backfill in utility trenches or other areas requiring backfill, and for other purposes as necessary. Any topsoil existing at the site shall be excavated to a depth of 4 inches and, in so far as possible, used later in backfilling of disturbed areas. Excess satisfactory materials and topsoil shall become the property of the contractor and shall be disposed of off the confines of Government property on a daily basis at no additional cost to the Government. Excess satisfactory materials which may be used for fill at a jobsite different from that from which they were obtained will be treated as borrow.

6. SELECTION OF BORROW MATERIAL: Borrow material shall be selected to meet the requirements and conditions of the particular fill for which it is to be used.

6.1 Borrow For Use As Select Fill: Select fill shall be obtained from approved sources outside the limits of Government controlled land by and at the expense of the contractor.

6.2 Borrow For Use As Topsoil: Topsoil shall be obtained from approved sources outside the limits of Government controlled land by and at the expense of the contractor. After inspection and approval of the source of topsoil, and prior to stripping, rank growths of vegetation, stones, pavement or debris on the surface that might interfere with grading or later tillage operations shall be removed. Sod or other cover that cannot be disked or otherwise incorporated into the topsoil so that the topsoil can be spread properly shall be removed. Topsoil shall be removed to the depth specified by the Contracting Officer.

6.3 Borrow For Use As Earthen Fill: Earthen fill shall be obtained from approved sources outside the limits of Government controlled land by and at the expense of the contractor.

7. WAYBILLS AND DELIVERY TICKETS: Since payment for the quantity of borrow used in completion of the work will be made at the quantity negotiated and contained in each Task Order, submission of waybills and delivery tickets is not required.

8. MEASUREMENT:

8.1 Excavation: The quantity of excavation to be paid for will be the negotiated number of cubic yards of excavation or cut, as stated in the Task Order, and accepted in the completed work.

8.2 Borrow:

8.2.1 Borrow For Use As Select Fill: The quantity of borrow for use as select fill to be paid for will be the negotiated number of cubic yards of borrow for use as select fill, as stated in the Task Order, including purchase, excavation and transport to the jobsite, or stockpile area.

8.2.2 Borrow For Use As Topsoil Fill: The quantity of borrow for use as topsoil fill to be paid for will be the negotiated number of cubic yards of borrow for use as topsoil fill, as stated in the Task Order, including purchase, excavation and transport to the jobsite, or stockpile area .

8.2.3 Borrow For Use As Earthen Fill: The quantity of borrow for use as earthen fill to be paid for will be the negotiated number of cubic yards of borrow for use as earthen fill, as stated in the Task Order, including satisfactory fill other than select borrow material, or topsoil borrow material, excavated, purchased, transported to the jobsite, or stockpile area.

8.3 Placing Fill and Backfill: The quantity of placing fill and backfill, regardless of the type of fill or backfill installed, to be paid for will be the negotiated number of cubic yards of placing fill or backfill, as stated in the Task Order.

8.4 Sandstone Excavation: The quantity of sandstone excavation to be paid for will be the negotiated number of cubic yards of sandstone excavation or cut, as stated in the Task Order.

8.5 Compacted Subgrade:

8.5.1 Subgrade Construction: The quantity of subgrade construction to be paid for will be the negotiated number of square yards of new compacted subgrade, based on a 6-inch lift thickness, as stated in the Task Order.

8.5.2 Subgrade Repair/Recompaction: The quantity of existing subgrade repair/recompaction to be paid for will be the negotiated number of square yards of existing subgrade repair/recompaction, as stated in the Task Order.

9. BASIS FOR PAYMENT:

9.1 Excavation: Payment for the quantity of excavation, determined as specified above, will be made at the appropriate contract unit price per cubic yard, as established in the bid schedule for Airfield or Roadway work. Excavation for all purposes, including excavation required for repairs to existing subgrade/base course, is included in this bid item. Such payment shall constitute full compensation for all labor, materials, equipment, overhead, profit, supervision, and incidentals necessary to complete the work.

9.2 Borrow:

9.2.1 Borrow For Use As Select Fill: Payment for the quantity of borrow for use as select fill material, determined as specified above, will be made at the appropriate contract unit price per cubic yard, as established in the bid schedule for Airfield or Roadway work. Such payment shall constitute full compensation for all labor, materials, equipment, transportation, overhead, profit, supervision, and incidentals necessary to complete the work. Only excavation, purchase and transportation of select borrow materials is included in this bid item. Payment for placing or installing select borrow material will be made under the "Placing Fill and Backfill" payment paragraph below.

9.2.2 Borrow For Use As Topsoil Fill: Payment for the quantity of borrow for use as topsoil fill material, determined as specified above, will be made at the appropriate contract unit price per cubic yard, as established in the bid schedule for Airfield or Roadway work. Such payment shall constitute full compensation for all labor, materials, equipment, transportation, overhead, profit, supervision, and incidentals necessary to complete the work. Only excavation, purchase and transportation of topsoil borrow materials is included in this bid item. Payment for placing or installing topsoil borrow material will be made under the "Placing Fill and Backfill" payment paragraph below.

9.2.3 Borrow For Use As Earthen Fill: Payment for the quantity of borrow for use as earthen fill material, determined as specified above, will be made at the appropriate contract unit price per cubic yard, as established in the bid schedule for Airfield or Roadway work. Such payment shall constitute full compensation for all labor, materials, equipment, transportation, overhead, profit, supervision, and incidentals necessary to complete the work. Only excavation, purchase and transportation of earthen borrow materials is included in this bid item. Payment for placing or installing earthen borrow material will be made under the "Placing Fill and Backfill" payment paragraph below.

9.3 Placing Fill and Backfill: Payment for the quantity of placing fill and backfill, determined as specified above, will be made at the appropriate contract unit price per cubic yard, as established in the bid schedule for Airfield or Roadway work. Such payment shall constitute full compensation for all labor, equipment, overhead, profit, supervision, and incidentals necessary to complete the work. Only installation of fill and backfill materials is included in this bid item. By definition, fill material must be purchased by the contractor, and payment for excavating, purchasing and transporting fill material will be made under the "Borrow" payment clauses. By definition, backfill material is Government owned material, and payment for excavating backfill material will be made under the "Excavation" payment paragraph above.

9.4 Sandstone Excavation: Payment for the quantity of sandstone excavation determined as specified above, will be made at the appropriate contract unit price per cubic yard as established in the bid schedule for Airfield or Roadway. Such payment shall constitute full compensation for all labor, accessories, equipment, overhead, profit, supervision, and incidental necessary to complete the work.

9.5 Compacted Subgrade:

9.5.1 Subgrade Construction: Payment for the quantity of new subgrade construction, determined as specified above, will be made at the appropriate contract unit price per square yard, as established in the bid schedule for Airfield or Roadway work. Such payment shall constitute full compensation for all labor, materials, testing, equipment, transportation, overhead, profit, supervision, and incidentals necessary to complete the work. In the event that compacted subgrade in lifts either less than 6 inches or more than 6 inches in thickness is specified, the unit price paid for these thicknesses will be determined by prorating the appropriate contract unit bid price on a cost per inch thickness basis and either adding or subtracting from the contract unit bid price to determine the unit price to be paid.

9.5.2 Subgrade Repair/Recompaction: Payment for the quantity of existing subgrade repair/recompaction, determined as specified above, will be made at the appropriate contract unit price per square yard, as established in the bid schedule for Airfield or Roadway work. Such payment shall constitute full compensation for all labor, materials, equipment, transportation, overhead, profit, supervision, and incidentals necessary to complete the work.

PART 2 - EXECUTION

10. EXCAVATION:

10.1 General: Unsatisfactory materials encountered within the limits of the work shall be excavated below grade and replaced with satisfactory materials as directed. Satisfactory material not used in backfill shall be wind-rowed or stockpiled for use in construction of stabilized subgrade, backfilling utility trenches, or for other purposes as directed. Excess satisfactory material shall be disposed of off the confines of Government controlled property at no additional cost to the Government.

10.2 Subgrade: The Contractor shall perform excavation of the earthen material encountered within the limits of the project, to bring the surface of the subgrade to be compacted to the lines, grades, and elevations indicated and as specified herein. Grading shall be in conformity with the typical sections shown and the tolerances specified in paragraph FINISHING.

10.3 Miscellaneous: The Contractor shall perform excavation of the earthen material encountered within the limits of the project as required to construct inlet boxes, manholes, lay utility piping and accomplish repairs to existing base course subgrade and for other similar purposes. Excavations for installation of storm sewer piping shall be constructed to the lines, grades, and elevations indicated on the plans.

11. BORROW: Borrow operations shall be conducted off the confines of Sheppard AFB. Weighbills and delivery tickets shall be given to the Government inspector at the time of material delivery. Failure to comply with this provision of the contract could cause payment to be withheld for those materials.

12. FILL AND BACKFILL: The contractor shall install satisfactory backfill material obtained from excess excavation or fill material from borrow areas as described above to bring subgrade, or other areas up to the proper lines, grades, and elevations if required. Fill and backfill material shall be installed in lifts not in excess of 6 inches in thickness and each lift shall be placed and compacted to the density specified in TABLE I for the particular material being compacted. If placed against structures, compaction shall be accomplished in such a manner as to prevent wedging action or eccentric loading upon or against any structure.

12.1 Select Fill and Backfill: Select material shall be placed accurately as shown in the details. Select material shall be installed to fully support haunches and bells of underground utility piping as required.

12.2 Topsoil Fill and Backfill: Prior to installing topsoil fill or backfill vegetation that may interfere with operations shall be mowed, grubbed, and raked. The collected material shall be removed from the limits of Government controlled property. The surface shall be cleaned of stumps, and stones larger than 2 inches in diameter, and roots, cable, wire and other materials that might hinder the work or subsequent maintenance shall also be removed. Where any portion of the surface becomes gullied or otherwise damaged, the affected area shall be repaired to reestablish the condition

and grade prior to installation of topsoil fill or backfill. Immediately prior to dumping and spreading topsoil, the subgrade or earth to receive topsoil shall be double tilled to a depth of 4 inches using a chisel plow with the chisels set not more than 10 inches apart. Tillage shall be accomplished across the slope. Topsoil shall be spread so that planting can proceed with little additional soil preparation or tillage. Surface irregularities resulting from topsoiling or other operations shall be leveled to prevent depressions. Topsoil shall not be placed when the subgrade or fill is frozen, excessively wet or compacted, extremely dry, or in a condition detrimental to the proposed planting or grading. Topsoil shall be uniformly distributed and evenly spread to a minimum thickness of 4 inches in preparation for establishment of turf as specified in SECTION: ESTABLISHMENT OF TURF. Where any portion of the surface becomes gullied or otherwise damaged, the affected area shall be repaired to establish the condition and grade prior to topsoiling.

12.3 Earthen Fill and Backfill: Earthen materials other than select materials and topsoil materials shall be placed accurately to the proper grades as specified and shown on the plans.

13. COMPACTED SUBGRADE PREPARATION:

13.1 New Subgrade Construction: Excavation, fill and backfill shall be accomplished such that the subgrade is shaped to the line, grade, and cross section required by the plans. The subgrade shall then be compacted to the specified dry density shown in TABLE I. This operation shall include plowing, disking, and any moistening or aerating required to obtain the specified compaction. After rolling, the surface of the subgrade for roadways, curb and gutter, sidewalks, or airfield pavements shall not show deviation greater than 1/4 inch when tested with a 10-foot straightedge applied both parallel and at right angles to the centerline. When drawings require only that the overburden of earth be removed with the new base course being placed directly on the exposed subgrade with no plowing, disking, and any moistening, aerating or compaction of the subgrade, then that subgrade will be designated "insitu" and will not be included in measurements for new subgrade construction.

13.2. Compaction: Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment well suited to the type of material being compacted.

13.3 Existing Subgrade Repair/Recompaction: When conditions indicate that existing subgrades are soft or have failed, excavation of overlying pavement structures shall be accomplished in accordance with this section, and SECTION: DEMOLITION to expose the subgrade to be repaired/recompacted. Failed or soft subgrade shall be shaped, installed to proper grade and well compacted.

13.3.1 Compaction: Depending on the size of the area requiring repair, compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, jumping jacks, hand-operated vibratory plates, or other approved equipment well suited to the type of material being

compacted. Laboratory and field density determination will not be required for subgrade repair/recompaction. Field density will be determined by visual means. However, no subsequent pavement structure shall be placed until the repaired/recompacted subgrade is inspected and approved.

14. FINISHING: The surface of all subgrades shall be finished to a smooth and compact surface in accordance with the lines, grades, and cross sections or elevations shown. The degree of finish for all graded areas shall be within 0.1 foot of the grades and elevations indicated except that the degree of finish for subgrades shall be specified in paragraph COMPACTED SUBGRADE PREPARATION above.

15. PROTECTION: During construction, excavations and subgrade shall be kept shaped and drained if possible. The finished subgrade shall be protected from traffic or other operations and shall be protected and maintained by the contractor in a satisfactory condition until the succeeding course is placed. The storage or stockpiling of materials on the finished subgrade will not be permitted. No succeeding course shall be laid until the subgrade has been checked and approved, and in no case shall successive courses be placed on a muddy, spongy, or frozen subgrade.

16. TESTING: Testing shall be the responsibility of the Contractor and shall be performed at no additional cost to the Government. Testing shall be performed by an approved commercial testing laboratory regularly engaged in such testing. Field in-place density shall be determined in accordance with ASTM D 1556 or ASTM D 2922. When ASTM D 2922 is used, the calibration curves shall be checked and adjusted using only the sand cone method as described in ASTM D 1556. ASTM D 2922 results in a wet unit weight of soil and when using this method ASTM D 3017 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gages shall also be checked along with density calibration checks as described in ASTM D 3017. The calibration checks of both the density and moisture gages shall be made at the beginning of a job on each different type of material encountered and in intervals as directed by the Contracting Officer. Within 24 hours of conclusion of physical tests, 4 copies of test results, including calibration curves and results of calibration tests, shall be furnished to the Contracting Officer. When test results indicate, as determined by the Contracting Officer, that compaction is not as specified, the material shall be removed, replaced and recompacted to meet specification requirements, at no additional expense to the Government. Tests on recompacted areas shall be performed to determine conformance with specification requirements. Inspections and test results shall be certified by a registered professional civil engineer. These certifications shall state that the tests and observations were performed by or under the direct supervision of the engineer and that the results are representative of the materials or conditions being certified by the tests. The frequencies of testing as established in SECTION: CONTRACTOR QUALITY CONTROL will be minimum acceptable for each type of subgrade compacting operation.

16.1 In-Place Density: In-place density shall be determined at the frequency specified in SECTION: CONTRACTOR QUALITY CONTROL.

16.2 Check Tests on In-Place Densities: If ASTM D 2922 is used, in-place densities shall be checked by ASTM D 1556 as follows:

a. One check test per lift for each 5,000 square yards, or fraction thereof, of each lift of compacted subgrade constructed on areas to receive pavement, curb and gutter or valley gutter.

b. One check test per lift for each 5,000 square yards, or fraction thereof, of compacted subgrade or fill on areas to receive sidewalks.

16.3 Optimum Moisture and Laboratory Maximum Density: Tests shall be made for each type material encountered existing in the work or source of material including borrow material to determine the optimum moisture and laboratory maximum density values. One representative test per 1000 cubic yards of each type of fill shall be made.

16.4 Tolerance Tests for Subgrades: Continuous checks on the degree of finish specified in paragraph SUBGRADE PREPARATION shall be made during construction of the subgrades. However, any Grade Elevation requiring payment under SECTION: GRADE ELEVATION, shall be approved prior to accomplishment.

TABLE I

	% LABORATORY DENSITY	
MATERIAL	COHESIONLESS SOIL	COHESIVE SOIL
Subgrade/Fill/Backfill Under Sidewalks	95%	90%
Subgrade/Fill/Backfill Under Roadway Pavement	95%	90%
Subgrade/Fill/Backfill Under Valley Gutter	95%	90%
Subgrade/Fill/Backfill Under Curb and Gutter	95%	90%
Subgrade/Fill/Backfill Under Airfield Pavement	100%	95%
Fill/Backfill Under Grassed Areas	90%	85%

SECTION 2C

LIME-STABILIZED SUBGRADE

PART 1 - GENERAL

1. APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

1.1 Military Standards (Mil. Std.):

MIL-STD-621A,	15 Jul 95, Notice 3, 22 Dec 64, Notice 1, 02 Jun 66, Notice 2, 06 Dec 68	Test Method for Pavement Subgrade, Subbase, and Base-Course Materials

1.2 American Society for Testing and Materials (ASTM) Publications:

C 25-96	1996	Chemical Analysis of Limestone, Quicklime, and Hydrated Lime
C 50-94	1994	Sampling, Inspection, Packing, and Marking of Lime and Limestone Products
C 136-96	1996	Method for Sieve Analysis of Fine and Coarse Aggregates
D 422 E1-63	(R I990)	Particle-Size Analysis of Soils
D 559-96	1996	Wetting-and-Drying Tests of Compacted Soil-Cement Mixtures
D 560-96	1996	Freezing-and-Thawing Tests of Compacted Soil-Cement Mixtures
D 977-91	1991	Emulsified Asphalt
D 1556-90	1990	Density of Soil in Place by the Sand-Cone Method
D 1632-96	1996	Making and Curing Soil-Cement Compression

		and Flexure Test Specimens in the Laboratory
D 1633-96	1996	Compressive Strength of Molded Soil-Cement Cylinders
D 2027-76	(R1992)	Cutback Asphalt (Medium Curing Type)Emulsified Asphalt
D 2028-76	(R 1992)	Cutback Asphalt (Rapid-Curing Type)
D 2922-91	1991	Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
D 3017-88	(R 1993)	Moisture Content of Soil and Soil-Aggregate In Place By Nuclear Methods (Shallow Depth)
D 4318 REV A-95	1995	Liquid Limit, Plastic Limit and Plasticity Index of Soils
E 11-95	1995	Wire Cloth Sieves for Testing Purposes

2. GENERAL: The work specified herein consists of the construction of a lime-stabilized subgrade course. The work shall be performed in accordance with this specification and shall conform to the lines, grades, notes, and typical sections shown in the plans.

3. DEFINITIONS:

3.1 Lime-Stabilized Subgrade: Lime-stabilized subgrade, as used herein, is a mixture of lime and on-site, backfill, or earthen borrow material blended to form a mixture that meets all criteria as set forth in the plans and this specification.

3.2 Degree of Compaction: Degree of compaction required is expressed as a percentage of the maximum dry density obtained by the test procedure presented in MIL-STD-621, Method 100, compaction effort designation CE 55. This will be abbreviated below as a percentage of laboratory maximum dry density.

4. PLANT, EQUIPMENT, MACHINES, AND TOOLS:

4.1 General Requirements: Plant, equipment, machines, and tools used in the work shall be subject to approval and shall be maintained in satisfactory working condition at all times. Other compacting equipment may be used in lieu of that specified, where it can be demonstrated that the results are equivalent. The equipment shall be adequate and have the capability of producing the results specified. Protective equipment, apparel, and barriers shall be provided to protect the eyes, respiratory system, and the skin of workers exposed to contact with lime dust or slurry.

4.2 Steel-Wheeled Rollers: Steel-wheeled rollers shall be the self-propelled type weighing not less than 10 tons, with a minimum weight of 300 pounds per inch width of rear wheel. Wheels of the rollers shall be equipped with adjustable scrapers. The use of vibratory rollers is optional.

4.3 Pneumatic-Tired Rollers: Pneumatic-tired rollers shall have four or more tires inflated to a minimum pressure of 150 PSI. The loading shall be equally distributed to all wheels, and the tires shall be uniformly inflated. Towing equipment shall also be pneumatic-tired.

4.4 Slurry Spreader: Lime Slurry spreader shall be self-propelled or attached to a propelling unit capable of moving the spreader. The device shall be steerable and shall have variable speeds forward and reverse. The spreader and propelling unit shall be carried on tracks, rubber tires, or drum-type steel rollers that will not disturb the underlying material. The spreader shall contain a tank, and spray bars capable of applying the lime slurry at the required rate.

4.5 Sprinkling Equipment: Sprinkling equipment shall consist of tank trucks, pressure distributors, or other approved equipment designed to apply controlled quantities of water uniformly over variable widths of surface.

4.6 Tampers: Tampers shall be of an approved mechanical type, operated by either pneumatic pressure or internal combustion, and shall have sufficient weight and striking power to produce the compaction required.

4.7 Straightedge: The Contractor shall furnish and maintain at the site, in good condition, one 10-foot straightedge for use in the testing of the finished surface. Straightedge shall be made available for Government use. Straightedges shall be constructed of aluminum or other lightweight metal and shall have blades of box or box-girder cross section with flat bottom reinforced to insure rigidity and accuracy. Straightedges shall have handles to facilitate movement on pavement.

4.8 Bituminous Distributor: The distributor shall have pneumatic tires of such size and number to prevent rutting, shoving, or otherwise damaging the base surface or other layers in the pavement structure. It shall be designed and equipped to spray the bituminous material in a uniform double or triple lap at the specified temperature, at readily determined and controlled rates with an allowable variation from the specified rate of not more than plus or minus 5 percent, and at variable widths. Distributor equipment shall include a separate power unit for the bitumen pump, full-circulation

spray bars, tachometer, thermometer for reading the temperature of tank contents, and a hand hose attachment suitable for applying bituminous material manually to areas inaccessible to the distributor. The distributor shall be equipped to circulate and agitate the bituminous material during the heating process.

5. WEATHER LIMITATIONS: Work on the lime stabilized subgrade shall not be performed during freezing temperatures. When the temperature is below 40 degrees F, the completed lime stabilized subgrade shall be protected against freezing by a sufficient covering of straw, or by other approved methods, until the course has dried out. Any areas of completed course that are damaged by freezing, rainfall, or other weather shall be brought to a satisfactory condition in conformance with this specification without additional cost to the Government. Lime shall not be applied when the atmospheric temperature is less than 40 degrees F. No lime shall be applied to soils that are frozen or contain frost, or when the underlying material is frozen. If the temperature falls below 35 degrees F, completed lime-treated areas shall be protected against any detrimental effects of freezing.

6. SAMPLING AND TESTING:

6.1 General Requirements: Sampling and testing shall be performed by a Government approved commercial testing laboratory regularly engaged in such testing. Tests shall be performed in accordance with SECTION: CONTRACTOR QUALITY CONTROL and herein to insure that materials and compaction meet specified requirements. Four (4) copies of the test results shall be furnished to the Contracting Officer within 24 hours of completion of tests.

6.2 Results: Results shall verify that the lime/soil mixture complies with this specification. When the material changes or deficiencies are found, the initial analysis shall be repeated and the material already placed shall be retested to determine the extent of unacceptable material. All in-place unacceptable material shall be replaced at no additional cost to the Government.

6.3 Sampling: Samples of lime shall be taken in accordance with ASTM C 50. Specimens for the unconfined compression tests shall be prepared in accordance with ASTM D 1632.

6.4 Sieve Analysis: Sieve analysis shall be performed in accordance with ASTM C 136 and ASTM D 422 on sieves conforming to ASTM E 11.

6.5 Liquid Limit and Plasticity Index: Liquid limit and plasticity index shall be in accordance with ASTM D 4318.

6.6 Chemical Analysis: Lime shall be tested for the specified chemical requirements in accordance with ASTM C 25. Three tests shall be conducted for each delivery of lime.

6.7 Sampling and Testing During Construction: Quality control sampling and testing during construction shall be performed as specified in SECTION: CONTRACTOR QUALITY CONTROL and herein.

7. SUBMITTALS:

7.1 Quality Control Results: Results of laboratory tests for quality control purposes shall be submitted to the Contracting Officer and approved prior to using the material.

7.2 Field Tests: Copies of field test results shall be submitted within 24 hours after the tests are performed.

7.3 Test Results: Calibration curves and related test results shall be submitted prior to using the device or equipment being calibrated.

7.4 Bituminous Materials: Certified copies of manufacturer's test results indicating compliance of bituminous material with applicable specified requirements shall be submitted to the Contracting Officer not less than 30 days before the material is required in the work.

7.5 Approval of Materials: Sources of all materials shall be selected well in advance of the time that materials will be required in the work. Test results from samples shall be submitted for approval not less than 30 days before material is required for the work.

7.6 Mix Design: Contractor shall develop and submit for approval a proposed mix design prior to stabilization work. Mix shall be developed using samples of the material to be stabilized. Mix design will be capable of producing a compressive strength of 150 PSI when compacted to the design percentage of laboratory maximum dry density. Samples shall not show any significant loss of strength after 12 cycles of the durability test.

7.6.1 Laboratory Density: Tests shall provide a moisture-density relationship for the lime-soil mixture. Tests shall be conducted in accordance with the standards specified in paragraph DEGREE OF COMPACTION.

7.6.2 Unconfined Compression Testing: Unconfined compression tests shall be conducted in accordance with ASTM D 1633. Three tests shall be conducted for each mix design tested. Samples shall be cured at a constant moisture content and temperature for 28 days.

7.6.3 Durability Tests: Wet-dry tests shall be conducted in accordance with ASTM D 559. Freeze-thaw tests shall be conducted in accordance with ASTM D 560. Three tests shall be conducted for each mix design tested. Scratch portion of the test shall be omitted.

8. STOCKPILING MATERIALS: Satisfactory backfill material available from excavation and grading, shall be stockpiled in the manner and at the locations

designated. Before stockpiling material, storage sites shall be cleared and sloped to drain. Materials obtained from different sources shall be stockpiled separately.

9. MEASUREMENT:

9.1 Lime-Stabilized Subgrade: The quantity of lime stabilized subgrade to be paid for will be the negotiated number of square yards of lime stabilized subgrade, based on a 6 inch lift thickness, as stated in the Task Order.

9.2 Measurement of excavation, fill, backfill, and other related items will be made as specified in the measurement clause contained in the specification section dealing with their accomplishment.

10. BASIS FOR PAYMENT:

10.1 Lime-Stabilized Subgrade: Payment for the quantity of lime stabilized subgrade, determined as specified above, will be made at the appropriate contract unit price per square yard, as established in the bid schedule for Airfield or Roadway work. Such payment shall constitute full compensation for all labor, materials (including lime and bituminous materials), testing, equipment, overhead, profit, supervision, and incidentals necessary to complete the work. In the event that lime stabilized subgrade in lifts either less than 6 inches or more than 6 inches in thickness is specified, the unit price paid for these thicknesses will be determined by prorating the appropriate contract unit bid price on a cost per inch thickness basis and either adding or subtracting from the contract unit bid price to determine the unit price to be paid.

10.2 Excavation and Backfill: Payment for the quantity of excavation, fill, and backfill and other related items required will be made as specified in the payment clause contained in the specification section dealing with their accomplishment.

PART 2 - PRODUCTS

11. MATERIALS:

11.1 Lime: Lime shall be a standard brand of hydrated lime conforming to the following physical and chemical requirements:

11.1.1 Lime shall be of such gradation that 99-1/2 percent passes a No. 20 sieve and a minimum of 85 percent passes a No. 100 sieve.

11.1.2 Combined calcium oxide and magnesium oxide shall be not less than 70 percent.

11.2 Bituminous Material: Material shall conform to one of the following:

11.2.1 Cutback Asphalt: ASTM D 2027 or D 2028, Grade RC-250 or MC-250.

11.2.2 Emulsified Asphalt: ASTM D 977, Type RS-1 or RS-2.

11.3 Water: Water shall be clean, fresh, and free from injurious amounts of oil, acid, salt, alkali, organic matter, and other substances deleterious to the lime or soil-lime mixture, and shall be subject to approval.

PART 3 - EXECUTION

12. GENERAL REQUIREMENTS:

12.1 Lime Stabilized Subgrade Over Compacted Subgrade: Lime stabilization operations shall not begin until the compacted subgrade has been completed and accepted. Soft, yielding areas and ruts or other irregularities in the subgrade surface shall be corrected. The material in the affected areas shall be loosened and unsatisfactory material removed. Approved fill or backfill material shall be added where directed. The area shall then be shaped to line, grade, and cross section, and shall be compacted to the specified density. Compacted subgrade shall conform to SECTION: EXCAVATION, AND PREPARATION OF SUBGRADE. After the compacted subgrade has been accepted, approved earthen fill or backfill material to comprise the lime-stabilized subgrade shall be placed thereon. Any earthen material required to complete the lime stabilized course shall be backfill material obtained from windrows at the site, or shall be fill materials obtained from off base borrow areas. The backfill or fill shall be spread over the compacted subgrade, thoroughly pulverized and scarified to remove lumps and clods and prepared for the application of lime.

12.2 Lime Stabilized Subgrade With No Compacted Subgrade: Topsoil existing at the site shall be stripped to a depth of 4 inches and stockpiled or wind-rowed for later use as backfill material. The subgrade shall be cut to obtain proper line and grade. Low areas shall be raised by installation of backfill material from cut areas or earthen fill material obtained from off base borrow areas. After the subgrade to be stabilized has been brought to proper line and grade the entire area shall be thoroughly pulverized and scarified to remove lumps and clods and prepared for the application of lime.

13. INSTALLATION: The mixed in-place method of lime is specified, however, other methods, such as remote mixing may be approved by the Contracting Officer, at no additional cost to the Government. Lime shall be applied as a slurry, using equipment specified in paragraph EQUIPMENT. After application of the lime slurry is completed, the material shall be thoroughly blended into the soil material to be stabilized such that the proportions of the mixture are in accordance with the approved mix design and the proper cross-section is obtained. Additional water shall be blended into the mix, or the mix shall be scarified and aerated as necessary to bring the moisture content towards optimum. Field moisture content shall be controlled within plus or minus 2 percent of optimum as a minimum requirement. Water may be added in increments as large as the equipment will permit; however, such increment of water shall be partially incorporated in the mix to avoid concentration of water near the surface. After the last increment of water has been added, mixing shall be continued until the water is uniformly distributed throughout the full depth of the mixture. Particular care shall be taken to ensure satisfactory moisture distribution along the

edges of the section. Adequate drainage shall be provided during the entire construction period to prevent water from collecting or standing on the area to be stabilized or on pulverized, mixed, or partially mixed material.

13.1 Edges of Stabilized Course: Approved material shall be placed along the edges of the stabilized course in such quantity as will compact to the thickness of the course being constructed, allowing at least a 1 foot width of the shoulder to be rolled and compacted simultaneously with the rolling and compacting of the lime stabilized course.

13.2 Grade Control: Thickness of the stabilized-course shall be such that the finished stabilized course with the subsequent surface courses will meet the fixed grade. Finished and completed stabilized area shall conform to the lines, grades, cross section, and dimensions indicated. Line and grade stakes shall be provided as necessary for control. Grade stakes shall be in lines parallel to the centerline of the area under construction and suitably spaced for string lining. However, any surveying requiring payment under SECTION: SURVEYING, shall be approved prior to accomplishment.

13.3 Layer Thickness: Compacted thickness of the stabilized course shall generally be 6 inches in thickness unless otherwise directed.

13.4 Compaction: Before compaction operations are started and as a continuation of the mixing operation, the mixture shall be thoroughly loosened and pulverized to the full depth. Compaction shall be started immediately after mixing is completed. During final compaction, the surface shall be moistened, if necessary, and shaped to the required lines, grades, and cross section. Density of compacted mixture shall be at least that shown in TABLE I. Rolling shall begin at the outside edge of the surface and proceed to the center, overlapping on successive trips at least one-half the width of the roller. Alternate trips of the roller shall be slightly different lengths. The speed of the roller at all times shall be such that displacement of the mixture does not occur. Areas inaccessible to the rollers shall be compacted with mechanical tampers, and shall be shaped and finished by hand methods.

13.5 Finishing: The surface of the top layer shall be finished to the grade and cross section shown. The surface shall be of uniform texture. Light blading during rolling may be necessary for the finished surface to conform to the lines, grades, and cross sections. Should the surface for any reason become rough, corrugated, uneven in texture, or traffic-marked prior to completion, such unsatisfactory portions shall be scarified, reworked, relaid, or replaced as directed. Should any portion of the course, when laid, become watersoaked for any reason, that portion shall be removed immediately, and the mix placed in a windrow and aerated until a moisture content within the limits specified is obtained, and then spread, shaped, and rolled as specified above.

13.6 Construction Joints: Construction joints will not be permitted unless specifically authorized. Once lime stabilization operations have begun they shall proceed, uninterrupted, until complete.

13.7 Curing and Protection: Immediately after the soil-lime area has been finished as specified above, the surface shall be protected against rapid drying for 7 days by the application of bituminous material. Bituminous material shall be uniformly applied by means of a bituminous distributor within the temperature range recommended by the material manufacturer. Bituminous material shall be applied in quantities of not less than 0.1 gallon per square yard nor more than 0.25 gallon per square yard. Areas inaccessible to or missed by the distributor shall be properly treated using the manually operated hose attachment. Bituminous material shall be applied only to the top layer. At the time the bituminous material is applied, the surface of the area shall be free of loose or foreign matter and shall contain sufficient moisture to prevent excessive penetration of the bituminous material. When necessary, the area shall be sprinkled immediately before the bituminous material is applied. Treated surface shall be sanded or dusted to prevent the bituminous material from being picked up by traffic if required by the Contracting Officer.

14. FIELD QUALITY CONTROL:

14.1 General: Results of field quality control testing shall verify that materials comply with this specification. When a material source is changed, the new material shall be tested for compliance. When deficiencies are found, the initial analysis shall be repeated and the material already placed shall be retested to determine the extent of unacceptable material. All in-place unacceptable material shall be replaced or repaired, as directed by the Contracting Officer, at no additional cost to the Government.

14.2 Thickness Control: Completed thicknesses of the stabilized course shall be within 1/2 inch of the thickness indicated. Where the measured thickness of the stabilized course is more than 1/2 inch deficient, such areas shall be corrected by scarifying, adding mixture of proper gradation, reblading, and recompacting as directed. Where the measured thickness of the stabilized course is more than 1/2 inch thicker than indicated, it shall be considered as conforming to the specified thickness requirement. Average job thickness shall be the average of all thickness measurements taken for the job, but shall be within 1/4 inch of the thickness indicated. Thickness of the stabilized course shall be measured at intervals in such a manner as to ensure one measurement for each 1,000 square yards of stabilized course. Measurements shall be made in 3-inch diameter test holes penetrating the stabilized course.

14.3 Testing: Testing shall be the responsibility of the Contractor and shall be performed at no additional cost to the Government. Testing shall be performed by an approved commercial testing laboratory regularly engaged in such testing. Field in-place density shall be determined in accordance with ASTM D 1556 or ASTM D 2922. When ASTM D 2922 is used, the calibration curves shall be checked and

adjusted using only the sand cone method as described in ASTM D 1556. ASTM D 2922 results in a wet unit weight of soil and when using this method ASTM D 3017 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gages shall also be checked along with density calibration checks as described in ASTM D 3017. The calibration checks of both the density and moisture gages shall be made at the beginning of a job on each different type of material encountered and in intervals as directed by the Contracting Officer. Within 24 hours of conclusion of physical tests, 4 copies of test results, including calibration curves and results of calibration tests, shall be furnished to the Contracting Officer. When test results indicate, as determined by the Contracting Officer, that compaction is not as specified, the material shall be removed, replaced and recompacted to meet specification requirements, at no additional expense to the Government. Tests on recompacted areas shall be performed to determine conformance with specification requirements. Inspections and test results shall be certified by a registered professional civil engineer. These certifications shall state that the tests and observations were performed by or under the direct supervision of the engineer and that the results are representative of the materials or conditions being certified by the tests. The frequencies of testing as established in SECTION: CONTRACTOR QUALITY CONTROL will be minimum acceptable for each type of lime stabilized subgrade compacting operation.

14.3.1 Check Tests on In-Place Densities: If ASTM D 2922 is used, in-place densities shall be checked by ASTM D 1556 as follows: One check test per lift for each 5,000 square yards, or fraction thereof, of each lift of compacted lime stabilized subgrade constructed on areas to receive pavement, curb and gutter or valley gutter.

14.3.2 Optimum Moisture and Laboratory Maximum Density: Tests shall be made for each type material encountered existing in the work or source of material including borrow material to determine the optimum moisture and laboratory maximum density values. One representative test per 1000 cubic yards of each type of material shall be made.

14.4 Smoothness Test: The surface of a stabilized layer shall show no deviations in excess of 3/8 inch when tested with the 10-foot straightedge. Deviations exceeding this amount shall be corrected by removing material and replacing with new material, or by reworking existing material and compacting, as directed. If directed, measurements for deviation from grade and cross section shown shall be taken in successive positions parallel to the road centerline with a 10-foot straightedge. Measurements shall also be taken perpendicular to the road centerline at 50-foot intervals.

15. TRAFFIC: Traffic, except that required for construction of the subsequent base course layer, will not be permitted on the lime stabilized course. Traffic will not be permitted on the area during the curing period.

16. MAINTENANCE: Stabilized area shall be maintained in a satisfactory condition until the completed work is accepted. Maintenance shall include immediate repairs of any defects and shall be repeated as often as necessary to keep the area intact. Defects shall be corrected as specified herein.

17. DISPOSAL OF EXCESS MATERIALS: Removed in-place materials that are excess after the lime stabilization work is complete shall be disposed of off the confines of Government property at no additional cost to the Government.

TABLE I

MATERIAL	% LABORATORY DENSITY
Lime Stabilized Subgrade Under Airfield Pavements	95%
Lime Stabilized Subgrade Under Roadway Pavement	90%
Lime Stabilized Subgrade Under Valley Gutter	90%
Lime Stabilized Subgrade Under Curb and Gutter	90%

SECTION 2D

GRADED-CRUSHED-AGGREGATE BASE COURSE

PART 1 - GENERAL

1. APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

1.1 Military Standard (Mil. Std.):

MIL-STD-621A,	15 Jul 95, Notice 3, 22 Dec 64, Notice 1, 02 Jun 66, Notice 2, 06 Dec 68	Test Method for Pavement Subgrade, Subbase, and Base-Course Materials

1.2 Texas State Department of Highways and Public Transportation (TSDHPT) Publication:

Standard Specifications for Construction of Highways, Streets and Bridges	(1993)	ITEM 216 ROLLING (PROOF) ITEM 247 FLEXIBLE BASE)

1.3 American Society for Testing and Materials (ASTM) Publications:

C 117-95	1995	Materials Finer Than 75um (No. 200) Sieve in Mineral Aggregates by Washing
C 136-96	1996	Method for Sieve Analysis of Fine and Coarse Aggregates
D 75-87	(R 1992)	Sampling Aggregates
D 1556-90	1990	Density of Soil in Place by the Sand-Cone Method
D 2487-93	1993	Classification of Soils for Engineering Purposes
D 2922-91	1991	Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
D 3017-88	(R 1993)	Moisture Content of Soil and Soil-Aggregate In Place By Nuclear Methods

		(Shallow Depth)
D 4318 REV A-95	1995	Liquid Limit, Plastic Limit and Plasticity Index of Soils
E 11-95	1995	Wire Cloth Sieves for Testing Purposes

2. DEGREE OF COMPACTION: Degree of compaction required is expressed as a percentage of the maximum dry density obtained by the test procedure presented in MIL-STD-621, Method 100 compaction effort designation CE 55. This will be abbreviated herein as percentage of laboratory maximum dry density.

3. EQUIPMENT: All plant, equipment, and tools used in the performance of the work will be subject to approval before the work is started and shall be maintained in satisfactory working condition at all times. The equipment shall be adequate and shall have the capability of producing the required compaction, meeting grade controls, thickness control, and smoothness requirements as set forth herein.

4. SAMPLING AND TESTING: Sampling and testing shall be performed by an approved commercial testing laboratory, regularly engaged in such testing, at the expense of the contractor. The materials shall be tested to establish compliance with the specified requirements. Within 24 hours of conclusion of physical tests, 4 copies of test results, including calibration curves and results of calibration tests, shall be furnished to the Contracting Officer. When test results indicate, as determined by the Contracting Officer, that compaction is not as specified, the material shall be removed, replaced and recompacted to meet specification requirements, at no additional expense to the Government. Tests on recompacted areas shall be performed to determine conformance with specification requirements. Inspections and test results shall be certified by a registered professional civil engineer. These certifications shall state that the tests and observations were performed by or under the direct supervision of the engineer and that the results are representative of the materials or conditions being certified by the tests. The frequencies of testing as established in SECTION: CONTRACTOR QUALITY CONTROL, and herein, will be the minimum acceptable for base course compaction operations.

4.1 Samples: Samples for material gradation, liquid limit, and plastic limit tests shall be taken in conformance with ASTM D 75 or corresponding TSDHPT standard. When deemed necessary, the sampling will be observed by the Contracting Officer.

4.2 Tests:

4.2.1 Sieve Analyses: Sieve analyses shall be made in conformance with ASTM C 117 and C 136 or corresponding TSDHPT standards. Sieves shall conform to ASTM E 11.

4.2.2 Liquid Limit and Plasticity Index: Liquid limit and plasticity index shall be determined in accordance with ASTM D 4318 or corresponding TSDHPT standard.

4.2.3 Density Tests: Field in-place density shall be measured in accordance with ASTM D 1556 or ASTM D 2922. For the method presented in ASTM D 1556 the base plate as shown in the drawing shall be used. When ASTM D 2922 is used, the calibration curves shall be checked and adjusted using only the sand cone method as described in ASTM D 1556. ASTM D 2922 results in a wet unit weight of soil and when using this method ASTM D 3017 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gauges shall also be checked along with density calibration checks as described in ASTM D 3017. The calibration checks of both the density and moisture gauges shall be made at the beginning of a job on the graded-crushed-aggregate base course material and in intervals as directed by the Contracting Officer.

4.3 Approval of Material: The source of material to be used for producing aggregates shall be selected at least 30 days prior to the time the material will be required in the work. Tentative approval of the source will be based on an inspection by the Contracting Officer. Tentative approval of material will be based on tests of samples for the specific job. Final approval of both the source and the material will be based on tests for gradation, liquid limit, and plasticity index performed on samples taken from the completed and compacted base course.

5. WEATHER LIMITATION: Base courses shall be placed when the atmospheric temperature is above 35 degrees F. Areas of completed base course that are damaged by freezing, rainfall, or other weather shall be corrected to meet specified requirement.

6. WAYBILLS AND DELIVERY TICKETS: Since payment for the quantity of graded-crushed-aggregate base course used in completion of the work will be made at the quantity negotiated and contained in each Task Order, submission of waybills and delivery tickets is not required.

7. MEASUREMENT:

7.1 Measurement of demolition, excavation, flowable fill, fly ash, and subgrade recompaction/repair will be made as specified in the measurement clause contained in the specification section dealing with their accomplishment.

7.2 Graded-Crushed-Aggregate Base Course: The quantity of graded-crushed-aggregate base course to be paid for will be the negotiated number of 2000-pound tons of graded-crushed-aggregate base course, as stated in the Task Order. This measurement will include graded-crushed-aggregate base course for all purposes and locations where graded-crushed-aggregate base course is specified for use by these specifications. Any material wasted, unused, rejected, used for the convenience of the contractor, or used for purposes other than those stated herein will not be included in these measurements.

7.3 Proof Rolling: The quantity of proof rolling to be paid for will be the negotiated number of square yards of proof rolling of existing base course without failure, regardless of the number of passes required, as stated in the Task Order.

7.4 Base Course Repair/Recompaction: The quantity of existing base course repair/recompaction to be paid for will be the negotiated number of square yards of existing base course repair/recompaction, as stated in the Task Order.

8. BASIS FOR PAYMENT:

8.1 Payment for demolition, excavation, flowable fill, and subgrade recompaction/repair will be made as specified in the payment clause contained in the specification section dealing with their accomplishment.

8.2 Graded-Crushed-Aggregate Base Course: Payment for the quantity of graded-crushed-aggregate base course determined as specified above will be made at the appropriate contract unit price, per 2000 pound ton, as established in the bid schedule for Airfield or Roadway work. Such payment shall constitute full compensation for all labor, materials, testing, equipment, overhead, profit, supervision, and incidentals necessary to complete the work.

8.3 Proof Rolling: Payment for the quantity of proof rolling determined as specified above will be made at the appropriate contract unit price, per square yard, as established in the bid schedule for Airfield or Roadway work. Such payment shall constitute full compensation for all labor, materials, equipment, overhead, profit, supervision, and incidentals necessary to complete the work.

8.4 Base Course Repair/Recompaction: Payment for the quantity of existing base course repair/recompaction determined as specified above will be made at the appropriate contract unit price, per square yard, as established in the bid schedule for Airfield or Roadway work. Such payment shall constitute full compensation for all labor, materials, equipment, overhead, profit, supervision, and incidentals necessary to complete the work.

PART 2 - PRODUCTS

9. AGGREGATES: Aggregates for new graded-crushed-aggregate base course shall consist of clean, sound, durable particles of crushed stone, and screenings. The contractor shall obtain materials that meet the specification and can be used to meet the grade and smoothness requirements specified herein, after all compaction has been completed. The aggregates shall be free of silt and clay as defined by ASTM D 2487, vegetable matter, and other objectionable materials or coatings. Aggregates shall be angular particles of uniform density, and shall meet the requirements of TSDHPT specifications ITEM 247, FLEXIBLE BASE); Grade 1, Type A, in all respects.

9.1 Gradation Requirements: Gradation requirements specified herein shall apply to the completed base course. The aggregates shall have a maximum nominal

size of 1 1/4 inches and be graded continuously well within the limits specified in Table I. Sieves shall conform to ASTM E 11.

TABLE I. GRADATION OF AGGREGATES	
Percentage by Weight Retained on Square-Mesh Sieve	
1-3/4 inch	----
7/8-inch	10-35
3/8-inch	30-50
No. 4	45-65
No. 40	70-85

9.2 Liquid Limit and Plasticity Index: Liquid limit and plasticity index requirements stated herein shall apply to any aggregate component that is blended to meet the required gradation and to the aggregate in the completed base course. The portion of the aggregate passing the No. 40 sieve shall be either nonplastic or have a liquid limit not greater than 35 and a plasticity index not greater than 10.

PART 3 - EXECUTION

10. OPERATION OF AGGREGATE SOURCES: The aggregate sources shall be operated in such a manner as to produce the quantity and quality of base course materials meeting these specification requirements in the specified time limits. Aggregate sources on private lands shall be conditioned in agreement with local laws of authorities.

11. STOCKPILING MATERIAL: Unless waived, stockpiling of graded-crushed-aggregate base course material will be permitted only at the contractor's designated stockpile area. Stockpiling on the pavement surface will be permitted only when approved on a location by location basis. At the completion of work, all unused aggregate shall be removed from the stockpile area and weighed. The certified ticket shall be given the Government inspector. Stockpiling shall be conducted, as directed by the Contracting Officer so as to prevent segregation. Materials obtained from different sources shall be stockpiled separately.

12. PROOF ROLLING: When replacement of the surface course of an existing pavement, either airfield or roadway and utilization of the existing base course/subgrade is contemplated and specified, proof rolling of the exposed base course shall be a requirement. After the existing asphalt wearing course has been stripped away, by cold milling or other mechanical means, or the concrete pavement has been removed by demolition, the entire surface to the exposed base course to be repaved shall be proof rolled to reveal failed or soft areas that require repair. Proof rolling of the entire surface of the base course shall consist of two proof rolling operations, one performed immediately after the existing pavement surface has been removed, to reveal soft areas in the existing base course/subgrade and one after